VOL. 5 OCTOBER • 1948 NO. 4

THE FOCAL SPOT

JOURNAL OF THE CANADIAN SOCIETY OF RADIOLOGICAL TECHNICIANS

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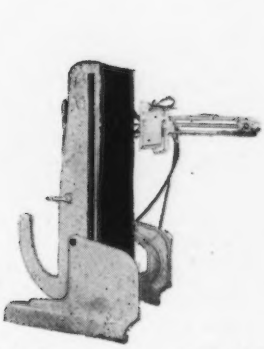

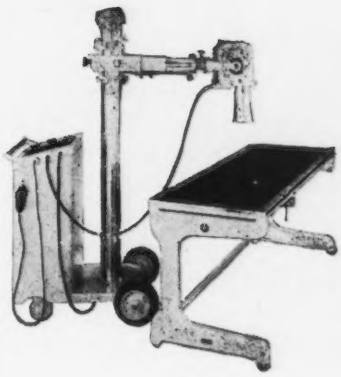

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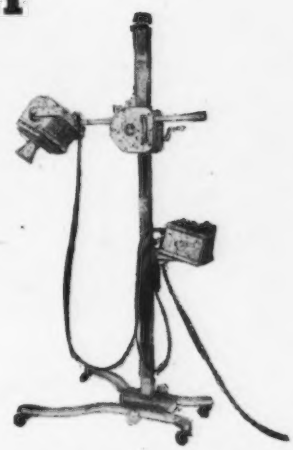

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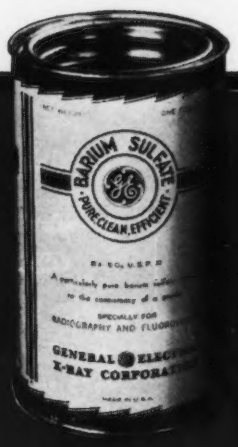

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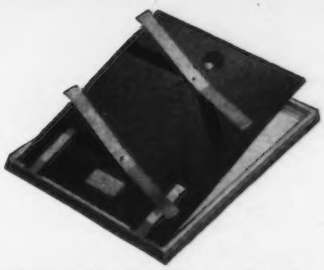

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News Items from the Provinces

ALBERTA SOCIETY OF RADIOLOGICAL TECHNICIANS

Since our adjournment for the summer last June there have been no meetings and consequently no Alberta News sent to The Focal Spot. Our first meeting of the 1948-49 season was held at the Colonel Belcher Hospital on September 21st, with an attendance of twenty-two regular members and six prospective student members were introduced to the membership. Plans were made to start the regular Monday evening study groups at the Colonel Belcher Hospital on October 4th, the first of the series to be on Physics and to be given by Mr. Cecil Bridgeman of the Picker X-Ray Company. The importance of members taking part in the monthly programmes was stressed by Miss Sutton, Chairman of the Programme Committee. Miss Shirley Grieve consented to act on the Programme Committee in place of Miss M. McDonald who has left our Calgary group to join our Edmonton cousins. The Calgary Society was recently invited to a Weiner Roast at the Shaw Ranch at Midnapore where we all enjoyed ourselves and finished the evening by going to a Western Country Dance at Red Deer Lake.

Mr. John Welch, our Alberta President and Alberta's Official Delegate to the Dominion Convention, reports a highly successful convention and gave us a very excellent report of the proceedings, which supplemented the interesting account given in the July Focal Spot. Mr. Herbert M. Welch, one of the Directors of the Canadian Society, who was also very much at the Convention and who does get around, as most of you know, reported that the Convention held in Quebec City was to his mind the most harmonious and successful yet held.

Speaking of the Convention, we heard that Mr. Herbert Welch's bag containing papers was sent directly to the hotel and was missing and very much sought after for several days after his arrival in Quebec, only to be found eventually at the foot of Mr. Simkins' bed where it had evidently been ever since their arrival. We wonder whether Mr. Simkins was just very busy or what?

While on the subject of Mr. Welch's doings we might mention that he attended an Executive meeting this summer while in Vancouver, which took place in Mr. Welch's cabin. The following evening he was invited to attend a party which was held at the summer cottage of one of the Shaughnessy Hospital staff. A very nice time was reported, singing, entertainment and much good food being enjoyed.

An invitation to the Edmonton Branch Annual Banquet was received in Calgary and two of our members were able to attend, namely, Mr. H. M. Welch and the writer, who had a very enjoyable time. The banquet was good and their choice of after-dinner speakers excellent. A dance followed the banquet. Then on Friday evening we two Calgarians met the Edmonton technicians at the Miseracordia Hospital for about four hours and were able to accomplish a good deal, such as the slate of proposed officers for the coming year, planning the Provincial Convention to be held in Calgary early in the Spring and getting many little items ironed out which can never be very satisfactorily settled by mail. The Edmonton group agreed that there were many things which needed more attention, increasing our Provincial membership being one of them, but we are hoping that the coming year will bear fruit in several respects. Those two days we spent in Edmonton were very pleasant and we thank you very much, Edmontonians.

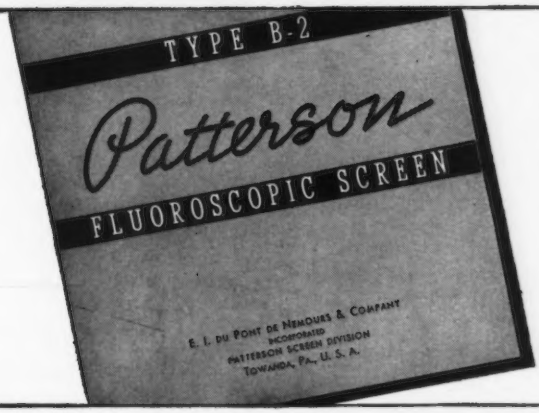
We in Calgary are pleased to hear that Dr. T. A. Bell has returned from Vancouver and is back at Dr. Quint's former office associated with Dr. K. D. Symington.

Our Calgary group has been invited to the home of Mrs. A. R. McIntyre for a Hallowe'en Party, but more about that later.

We have spoken to several enthusiastic Albertans who feel pretty hot about the province not having sent any articles in to The Focal Spot during the past year, so please, Alberta fellow-members, read the Report on The Focal

continued on page 187

Du Pont **TYPE B-2** a new, more brilliant Patterson Fluoroscopic Screen



TYPE B-2 is a new Patterson Fluoroscopic Screen that gives you 40% more brilliance than the present Type B Screen. It permits a more accurate diagnosis in less time. The new Screen makes use of a radically improved luminescent chemical; marks another milestone of Patterson progress.

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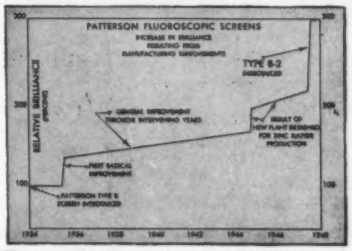

The graph above shows increased brilliance of the new Type B-2 Screen compared with that of the Type B. Note that the new Screen is three times as bright as the original Type B introduced in 1933.

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Spot on page 156 of the July, 1948, issue which says that Alberta had contributed no material during the past year and get down and do something about it.

—FRANCES SHAW, R.T.,
Sub-Editor.

EDMONTON SOCIETY

The Misericordia Hospital was the scene of the September meeting of the Edmonton Society of Radiological Technicians, with the 1948-49 officers presiding. They are:

President—Theresa St. Hilaire, R.T.

Vice-President—George Hall, R.T.

Secretary—Muriel Starratt.

A short talk was given by Dr. Mallett, stressing the fact that junior technicians should be given more training by the seniors in their departments. He suggested that a course be drawn up, which would cover the necessary topics in an easy fashion.

Plans were made for the annual banquet and dance which was held in the Corona Hotel on October 7th. Guests from out of town were Mr. and Mrs. Bert Welch and Francis Shaw from Calgary, and Miss Corainni from Lethbridge. The blessing was asked by Reverend Father Fournier. Toasts to the radiologists and technicians were proposed by Bert Welch and Dr. Mallett respectively. Dr. H. E. Duggan and Marie Towers replied. Dr. P. H. Malcolmson introduced the guest speaker, Dr. E. Allin, who highlighted a few interesting incidents in the early days of Radiography in Edmonton.

On behalf of the Society I would like to extend congratulations to the new R.T.'s—Vera Peters, Ruth Schultz and Marie Towers. We wish you every success.

—M. F.,
Sub-Editor.

BRITISH COLUMBIA SOCIETY OF X-RAY TECHNICIANS

The first meeting of the Fall season was held on Thursday, September 9th, at the B.C. Cancer Institute. About thirty-five members were in attendance. Mr. Mel Smith gave an interesting report on the convention happenings as he saw them. The meeting was then turned over to Dr. Batho of the Institute, who gave us a very interesting and instructive lecture on Half-value Layers. He was accorded a very attentive hearing and on completion of his address was thanked on behalf of the members by Mr. Stirling. We were then served tasty refreshments by the staff of the institute and conducted on a tour of their smart new premises. It was a very enjoyable evening in every way. Miss Lyons of the Shaughnessy Hospital won the drawing which is held at every meeting.

The next meeting will be held at St. Paul's Hospital on Thursday, October 14th, when the speaker is expected to be Mr. Jack Blair of the Victor X-Ray Corporation.

It is certainly pleasant to note the greater interest which is prevalent in our Society and it bodes well for the future. We have an excellent executive who are working hard to keep our society on the top.

HEAR AND THERE

We regret to announce the serious illness of Mr. Walter Miller, who is chairman of our programme committee, and everyone wishes him a speedy and complete recovery.

Thanks to all members for their response to our pleas for a name for the local bulletin. We want to get a lot more before we make a decision regarding the prize—so get busy and send in your suggestions.

Miss Pat Sweeney, our charming treasurer, is taking the middle aisle to happiness on October 11th. Her many friends in and out of the Society wish her a long and happy married life.

Mrs. Jack Blanchflower, formerly Miss Betty Campbell of our Society, presented Jack with a bouncing baby boy on October 1st. Congratulations from the whole B.C. Society to you both!

Keep your eye open for an announcement regarding our Annual Party which will be held in December. We expect it to go over with an even bigger bang than last year.

Best wishes to all our members who are sitting for the November examination. We hope you make the grade with ease. "R.T." in your cases will mean, "Really Trying."

—W. Q. STIRLING, R.T.,
Sub-Editor.

The Focal Spot

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Volume 5 TORONTO OCTOBER 1948 *Number 4*

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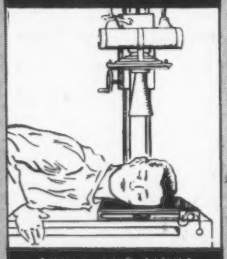

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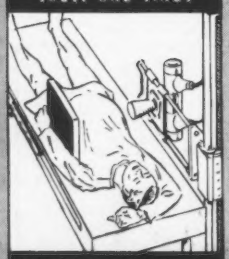

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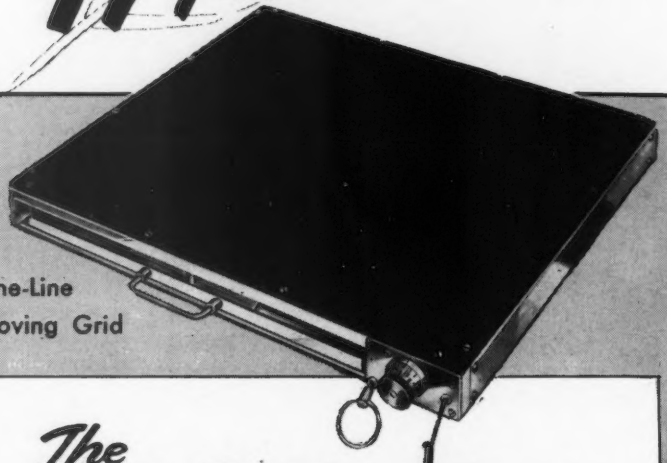

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Respiration and Radiography

By MARY F. CAMERON, R.T.
McGregor Clinic, Hamilton, Ontario

THE daily round of roentgenographic duty becomes completely lacking in interest when the x-ray technician ceases to wonder about the mechanical action taking place within the anatomical structures to be demonstrated and how this mechanical action may be applied to best advantage in improved x-ray techniques.

The act of breathing is a simple one, yet within its performance lies our ability to cough, sneeze, laugh, sing, cry — but most significant of all — to live! This is recognized by all, yet few have seemed to realize to what great advantage the various phases of this act may be applied in the practice of radiography. A brief summary of the mechanics of respiration may help to clarify the possibilities.

Mechanism of Respiration:

There are two major phases of the act of respiration — to inspire and expire, more commonly known as to "breathe in" and "breathe out." To "breathe in," air is drawn through the trachea and bronchi into the lungs. Simultaneously blood is sucked into the thoracic veins to avoid a vacuum, and the capillaries in the lungs dilate, stimulating pulmonary circulation. Co-ordinately, the dimensions of the chest cavity are increased due to the actions of the diaphragm and ribs. The diaphragm is a dome-like, muscular and tendinous septum separating the abdomen and thorax. It is muscular around the periphery and tendinous in the centre. When the muscular fibres contract, the diaphragm descends like a piston, drawing the central tendon and attached pericardium downwards, pushing before it the abdominal viscera. The abdominal wall is distensible enough to accommodate them. Thus, the vertical diameter of the thorax is enlarged. The A.P. and lateral dimensions of the thorax are increased due to the movement of the ribs. The ribs are elevated like the handle of a bucket, rotating about an axis through their anterior and posterior ends. Thus they become more horizontal and carry the sternum forward at the same time. In studying the process of inspiration, therefore, we learn that dimensions of the thorax and the abdomen are altered in three ways:

(1) The dome of the diaphragm descends, so the vertical diameter of the chest is increased, and the lugs are expanded.
(2) The lower ribs are elevated by the action of the intercostal muscles and accessory muscles of inspiration so that the A.P. and transverse diameters of the thorax are increased.
(3) Elevation of the eighth, ninth and tenth ribs is accompanied by a lateral and backward movement which increases the transverse diameter of the upper part of the abdomen. As the abdominal wall is elastic, the A.P. diameter of this is slightly increased, providing space for the viscera displaced by the decrease in vertical diameter.

Taking into account the dimensional increases effected by the action of the diaphragm upon inspiration, it is of further interest to note that upon expiration decrease of these dimensions will take place due to the elastic recoil of the lungs and thoracic walls and the action of the abdominal muscles which push back the displaced viscera.

The full range of movement of the diaphragm between deep inspiration and full

expiration has been stated by Halls-Dally to be thirty millimetres on the right and twenty-eight millimetres on the left, but, as all radiographers know, there can be no arbitrary figures. It will vary widely with different persons and circumstances. An illustration of this point, as well as of the dimensional changes in the thorax effected by the various respiratory phases, may be found in the reproduction of three chest films made on a short-chested, thick-set person — one at deep inspiration, one at mid inspiration, the third at full expiration. (Fig. 1.)

Measurements of the ratio of heart and chest diameters in all three films are as follows:

Full expiration - $\frac{14}{27}$

Mid inspiration - $\frac{14}{28}$

Deep inspiration - $\frac{13.2}{31}$

Upon comparison with an orthodiagram of the same patient the film made at mid inspiration proved most accurate as to heart size.

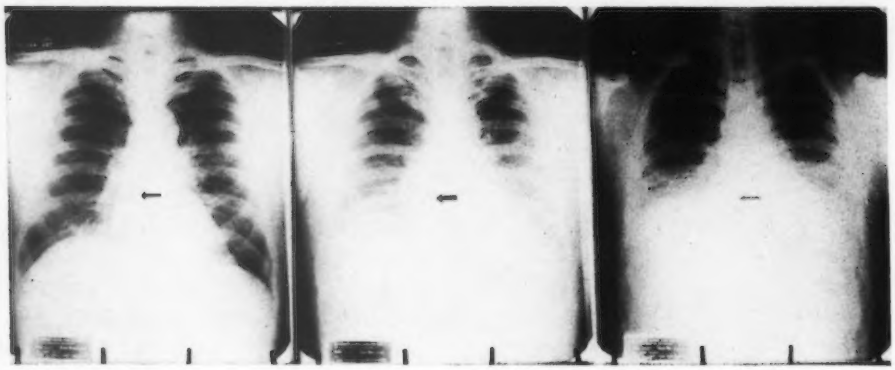

Fig. 1.
Three radiographs of short, thick-set patient, demonstrating the dimensional changes of the chest made possible by the use of three phases of respiration.

By actual film measurement the vertical diameter of the chest is increased, on the right by 3.5 centimetres, on the left by 6.7 centimetres at deep inspiration, the range of movement of the diaphragm between full expiration and deep inspiration being five centimetres on the right and 5.2 centimetres on the left.

The arrow in each film is at the level of the neck of the ninth rib, the lowest point of excursion of the diaphragm. This comparison will undoubtedly prove how the dimensional increases of a chest upon deep inspiration will provide additional information regarding the lower lung fields of a stout patient.

Recalling that upon deep inspiration, the vertical, antero-posterior and transverse diameters of the thorax are increased and the lungs expanded, it naturally follows that this is the phase of respiration commonly used in x-ray examinations of the lung. A change in respiratory phase will not alter the apical fields, however, as the thoracic inlet is a rigid ring.

Due to the elevation and spreading apart of the eighth, ninth and tenth ribs upon deep inspiration, the lower lung fields are more clearly demonstrated through the intercostal spaces.

The height of the diaphragm and range of its excursion will vary somewhat with

body position. If the patient is horizontal, the diaphragm will be highest and will perform its longest excursion with normal breathing. In the erect position the dome of the diaphragm falls and its movements are smaller, while in the sitting position it will fall still lower and perform its shortest excursion. In the horizontal lateral position the upper half will fall lower than in the sitting and move little, but the lower will rise higher in the thorax than when supine and its excursion will be increased.

Three factors influence this alteration of the height of the diaphragm:

(1) The elastic retraction of lung tissue (pulling up).
(2) The force of gravity (pulling down).
(3) Intra-abdominal tension due to contraction of abdominal wall musculature.

The abdominal muscles contract on standing, not sitting.

Thus the mechanism of respiration and manner in which it is influenced by body positioning lays open to the x-ray technician a thought-provoking field of its application with regard to radiographic technique.

Ribs:

Keeping in mind the advantage to be gained in control of the height of the diaphragm in chest x-rays, it can be readily understood that the same reasoning applies in rib examinations, as the ninth, tenth, and sometimes the eleventh ribs may be kept either above or below the diaphragm by varying the phase of respiration, and the use of the upright position.

(A slide shown at this point showed two films of ribs on same patient.)

These demonstrated:

(1) Diaphragm at level of tenth rib on deep inspiration.
(2) Diaphragm above level of ninth rib with full expiration.

Sternum:

The tremendous increase in the chest diameter upon deep inspiration is also of portent with regard to radiography of the sternum, as the hinge-like sternomanubrial joint permits the body of the sternum to move forwards and backwards. Thus, in P.A. oblique films of the sternum made on deep inspiration, the body and xiphoid are in closer proximity to the film. An advantage is gained also in the aeration of the soft lung tissues, intensifying contrast with bone density.

Unfortunately, however, this intensification of bone density occurs in the rib structures as well as in those of the sternum. Therefore, in a further effort to lessen the rib density, intensifying that of the sternum, we find that application of both respiratory phases by means of "panting" breathing will accomplish our purpose. With the use of a long time factor, the patient panting steadily during exposure, a more or less planigraphic effect is achieved, overlying structures being blurred almost to obliteration, while the sternum, being of greater density, shows as if radiographed just as its own level.

(At this point a slide was shown of two lateral views of the sternum.)

(1) Deep inspiration, (2) Full expiration, illustrating vast increase in chest diameter upon deep inspiration, due to hinge-like movement of sterno-manubrial joint which permits the body of the sternum to move backwards and forwards.

The advantage of the "panting" method of respiration in radiography of the sternum was also demonstrated in P.A. oblique radiography.

Gall-Bladder:

The range of abdominal tissue movement with change of respiration led me

to believe that in gall-bladder examination a change of respiratory phase might prove of value, as frequently a two to three centimetre alteration in the position of a gall-bladder shadow would draw it completely away from confusing gas shadows.

Similarly, in a radiograph made at full expiration which showed the gall-bladder overlying the spine or ribs, it seemed reasonable that it might be drawn down and laterally away from these bony structures by use of the opposite phase of respiration.

Previous to this study it had been our practice to make two initial films at different levels, both at full expiration. Upon changing this method to that of making both films at the same level, on one deep inspiration and one at full expiration, it was found that additional information was provided in the preliminary films. Slides were shown illustrating the various changes mentioned of the level of the gall-bladder by merely varying the respiratory phase, drawing it away from gas shadows and overlying bony structures. The application of this method is shown in Fig. 2.

(a) At deep inspiration, the fundus of the gall-bladder is at the level of the third lumbar vertebra, the lower end of the gall-bladder showing impingement of a gas shadow.

(b) At full expiration, the gall-bladder has risen four and one-half centimetres to the twelfth rib and is drawn completely away from gas shadows.

(c and d) X-ray films, same case.

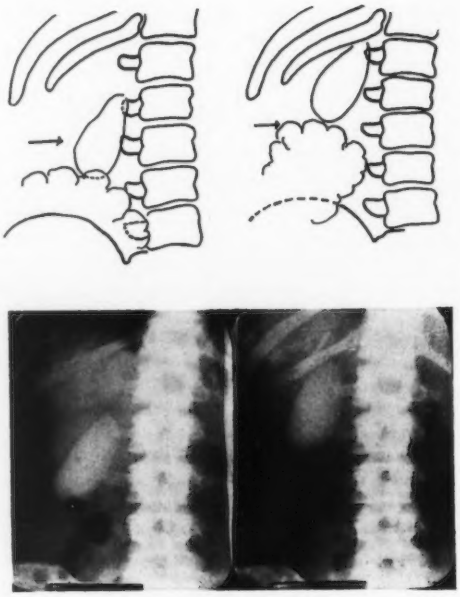

Fig. 2.
Diagrams and radiographs of gall bladder showing 4½ cms. change in position of gall bladder accomplished by means of varying the respiratory phase. In this instance, upon full expiration, the gall bladder is drawn away from an impinging gas shadow.

Kidneys:

It has been previously stated that the upper abdominal viscera descend before the contracting diaphragm on inspiration. The kidney being a retroperitoneal structure held laterally by the somewhat conical psoas muscle does not move laterally as freely as the gall-bladder, but has quite a range of movement up and down with change of respiration. Kidney radiographs are usually made at full expiration. Yet similarly as in gall-bladder films, the opposite phase may draw the shadow of a kidney or diodrast-injected calyx away from overlying shadows.

Extreme ptosis of the kidney is usually demonstrated by means of a radiograph made in the vertical position, yet an almost equivalent effect may be produced in a horizontal film made at deep inspiration. It has proved a satisfactory custom, therefore, to make the concluding film of a diodrast series in this manner, demonstrating any undue amount of kidney excursion.

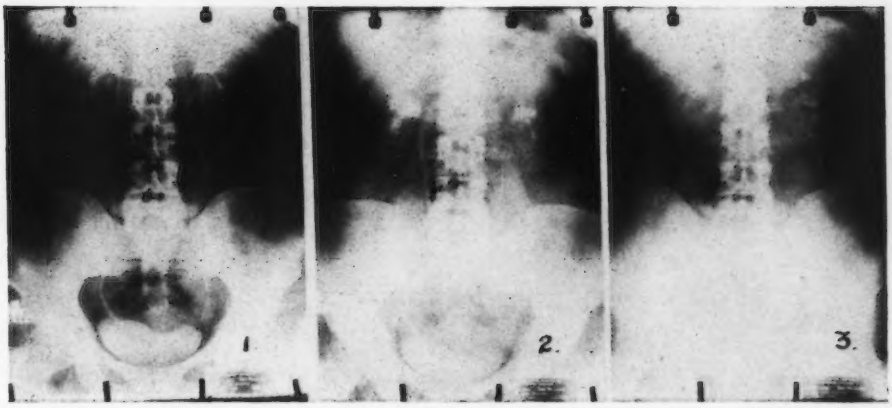

Fig. 3.
Three radiographs of a Diodrast series made on the same patient. (1) Film made in horizontal position at full expiration; (2) film made in horizontal position on deep inspiration; (3) film made in erect position upon expiration.

In Fig. 3 we have three films of diodrast series, on same patient, made at full expiration, deep inspiration, and vertically. Film on deep inspiration shows kidney pelves even lower than in vertical film.

Colon:

Complete diagnostic information regarding a colon examination cannot be provided without demonstration of both splenic and hepatic flexures. Yet frequently, the former at least is cut off in the final radiograph made at full expiration. Recalling the principle of the downward movement of viscera with deep inspiration, the use of this phase will usually demonstrate the complete colon.

Fig. 4 shows two radiographs of colon — one at full expiration, one at deep inspiration, the latter showing descent of the splenic flexure of five centimetres, drawing it well into the film.

Spine:

With regard to x-ray examination of the spine, the choice of respiration to be used will depend entirely on the area to be radiographed.

If pathology is suspected in the lower thoracic region, we must remind ourselves that by means of deep inspiration two more vertebrae will be shown above the descending diaphragm, thereby removing the menace of increased opacity and uneveness of radiographic effect. This will apply in lateral and oblique projections. The use of deep inspiration in anteroposterior views of the thoracic spine will bring the deeper muscles of the back into action, partly straightening the curve of the vertebral column, bringing it closer to the table top.

In a dorsolumbar projection, we attempt to demonstrate both the lower thoracic and lumbar vertebrae on the same film. We are forced to use a lumbar spine technique, and, in this instance, the full expiration phase is most helpful as the rising diaphragm acts more or less as a filter, preventing over-exposure of the lower thoracic area. Positioning must also be kept in mind, as in the horizontal the dia-

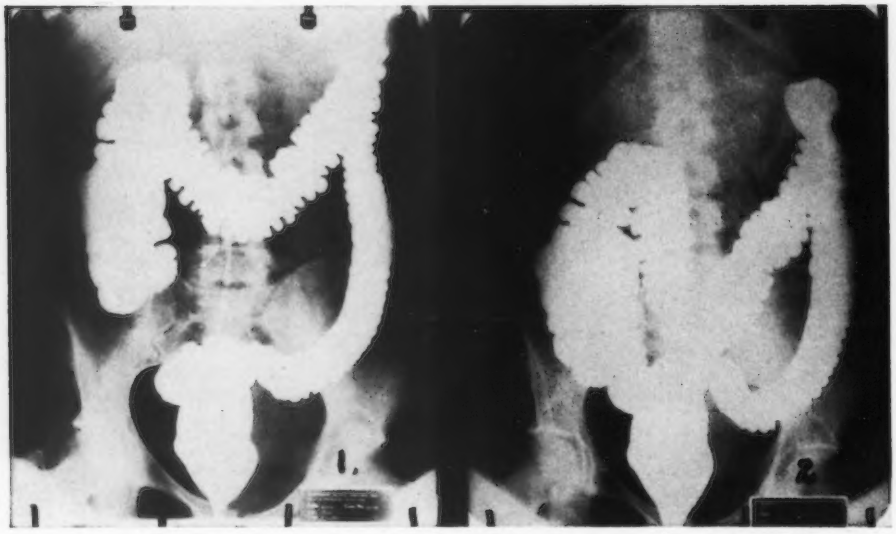

Fig. 4.
Two radiographs of colon on the same patient. (1) At full expiration; (2) upon deep inspiration, the latter showing descent of the splenic flexure of 4 cms. drawing it well down within the field of the radiograph.

phragm will be highest, if erect will fall lower, and in a sisting position will fall lowest of all. Control of the height of diaphragm may, therefore, materially effect the success or failure of a dorsolumbar spine.

In lateral thoracic spine technique, the "panting" method of respiration is also applicable, blurring the ribs and soft structure, enhancing the density of bone in the vertebrae, supplying a planagraphic effect.

Lateral films of dorsolumbar spine. (Fig. 5.)

(1) On deep inspiration with lowered diaphragm, lower thoracic vertebrae obscured.

(2) Full expiration, ascending diaphragm, acting as filter over lower thoracic area.
Fig. 6 shows lateral x-ray films of the thoracic spine at (1) full expiration and (2) deep inspiration demonstrating excursion of diaphragm and increased diameter of chest.

(3) Lateral film of thoracic spine demonstrates effect of "panting" method of respiration.

Pregnancy:

Recent experiments with various phases of respiration in lateral placentagrams show a pronounced descent of the fundus of the uterus on deep inspiration. The axis of the uterus shifts somewhat, showing it as more horizontal on deep inspiration than expiration. This brings the whole posterior wall of the uterus well away from the spine and gives better delineation of the posterior and inferior margins of the placenta. It would seem, therefore, that this would be of great benefit in lower placental implantations.

(At this point x-ray films were shown demonstrating the shift of the uterus, as occasioned by varying the phase of respiration.)

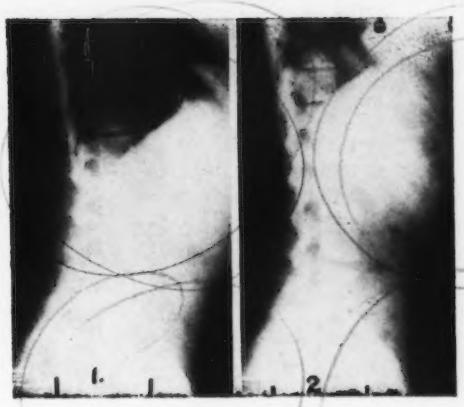

Fig. 5.
Lateral films of dorsolumbar spine. (1) Made on deep inspiration showing lower thoracic area blacked out; (2) on full expiration showing complete demonstration of dorsolumbar area due to "filtration effect" of raised diaphragm.

Summary and Conclusions:

(1) Study of the various phases of respiration and the proper application of their use could greatly improve x-ray techniques.

(2) Demonstration has been given both in diagrams and films of the value of films made in both respiratory phases in gall-bladder and kidney examinations.

(3) Dimensional changes effected in the chest by deep inspiration have been discussed and the advantages of its use shown in a comparative chest study.

(4) The advantages of control of the height of the diaphragm by means of respiration in thoracic spine technigue has been demonstrated.

(5) The somewhat planigraphic effect of "panting" respiration has been demonstrated in sternum and thoracic spine.

(6) The value of the use of both phases of inspiration in placental examination has been demonstrated.

In conclusion, the problems mentioned in these pages occur from day to day, the guide posts to the answers lie in our study of anatomy, the answers themselves can only be found by our eyes, minds and hands.

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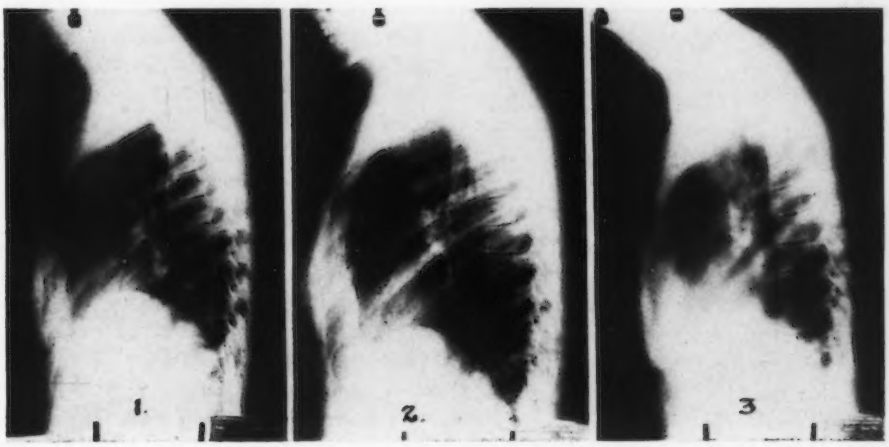

Fig. 6.
Three lateral films of thoracic spine showing dimensicnal changes effected in the chest by means of (1) full expiration, (2) deep inspiration, (3) panting" respiration.

Consideration of Radiation Protection*

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IT is becoming more and more important that the question of radiation protection be recognized, and gradually this problem is assuming a place on our programs.

We feel that in order to look at this problem scientifically, it is necessary to go back to the basic unit of x-ray measurement, which is the roentgen. We presume that most workers in an x-ray department have a pretty good idea of the scientific definition of a roentgen, but we feel in many instances that it is just so many words from a text book and the actual appreciation of the quantity of radiation is not recognized. In other words, if we are going to use this as a yard stick or measurement it is important that we know how long or how short this yard stick is. So, in the first place let us reduce this definition to its simplest language: the roentgen is the amount of x-ray or gamma radiation required to completely ionize 1 c.c. of air. Once having recognized this definition we next should know whether or not this is a large or small amount of radiation. Would this amount of radiation have any effect on an x-ray film? Would it have any effect on a patient or technician if he were exposed to such a direct beam temporarily? Or would it have any effect if a patient or worker were exposed to this quantity several times a day for several days? Or for more practical purposes, for what period of time could an individual absorb up to this quantity of radiation continuously with safety?

In order to answer some of these questions in a manner which is familiar to all x-ray personnel, let us look at the amount of radiation absorbed by the skin of a patient during an ordinary a.p. film of the abdomen, at 70 kv., 100 Ma., 1 sec. and 40-inch distance. We found in our department that this amounted to about 4 r, and we would just draw attention to the distance used here, as it will be referred to again later on.

Martin of the Physics Department of the Royal Cancer Hospital of London found that chest exposures averaged up to 2/10 r. Gall bladders averaged between 4 and 8 r. Single spines, around 5 r, but in some cases up as high as 34 r. Certain views in obstetrical investigations as high as 24 r, and occasionally up to 65 r. Dental films, from 5 r to 15 r. Lateral skulls, around 4 r.

There are two points here to which we would like to draw attention. First, the relatively small dose with chest exposures; and second, the excessive radiation (when one considers over-lapping) in dental radiography. It becomes evident then that the average exposures in a department will fall between 4 and 10 r per film, and we can consider them as an ultimate margin of safety at least something under 20 r for practically everything.

Once having recognized that there is an appreciable dose to ordinary diagnostic procedures, it next becomes a question as to whether such quantities of radiation have any effect upon the skin of an individual, and if not in themseves, how far can such multiple exposures be carried with absolute safety? McKee of Columbia University found that in the ranges

* Presented by Dr. Ripley before the Nova Scotia Society of Radiographers and the New Brunswick Society of X-ray Technicians at their joint meeting in Halifax on May 21st, 1948. Adapted for printing by K. Creelman, R.T., Moncton Hospital.

between 60 and 100 kv., epilation from the superficial skin was noted at about 330 r; and it has been previously noted that a minimal erythema in a patient of average complexion was noted at about 500 r. Therefore, we might consider as a maximum safety dose a total of 300 r.

It has been found from long years of experience, however, as far as workers are concerned, that much smaller doses over extended periods wil cause definite changes on localized areas. For example, repeated small doses on the hands will result eventually in a marked dermatitis with destruction of the superficial tissues; or if exposed to a less degree, one might note changes in the finger print with flattening of the skin pattern together with microscopic changes in the cuticle. One might notice as well longitudinal ridging of the nails, which eventually may become brittle so that they break and become ragged at the tips.

On the other hand, even extremely small doses of radiation to the whole body such as technicians risk will eventually initiate systemic changes to a worker. These are quite imperceptible as far as presumed well-being is concerned, but none the les may eventually result in impairment of health. Mattis Held of Stockholm investigated a series of over one thousand workers and he found that part of this group demonstrated an initial increase in the white cell count, while an approximately equal number first showed a slight diminution. He also noted that there was eventually a definite diminution in the red cell count. One interesting feature of this series was the fairly uniform increase of eosinophilia to an average of about 5% over the normal 1%. He later ran a second series of over seven hundred individuals and the results checked accordingly.

The International Congress of Radiology in 1937 advised that the upper limits of safety for x-ray workers should not exceed 2/10 r for any one day, with a maximum aggregate of 1 r in any one week. This would obviously imply that the average daily exposure to a worker's whole body should not exceed 1/6 to 1/7 r per day.

How is it possible then for the technician to determine roughly whether or not he or she is exceeding this permissible exposure? There are several methods which can conveniently be used, and perhaps the simplest — though perhaps not the most accurate — is the routine use of dental film and paper clip. We have found that a slight shadow of the paper clip can be identified after an exposure of from ½ to 1 r. In other words, if any one were to detect such a shadow on a film that had been worn not less than one week he would probably be within the relative limits of safety. A more accurate method, if one wishes to run the risk of breakage, would be to carry a thimble chamber of the usual Victoreen r-meter. Recently, however, special iometer chambers have been produced commercially which are equipped to clip into the pocket much the same as a fountain pen. These are calibrated in milli-roentgens, from which in conjunction with a small charger, a very accurate exposure can be directly determined. This is probably the most convenient and accurate procedure, especially in departments with a large volume of work.

From the patient's point of view, the technician should be familiar with the number of exposures which have been made in diagnostic work in any limited period of time, and it is of inestimable value to the Radiologist if he can depend upon his staff to keep him well posted in this matter.

We have shown that there is an appreciable skin exposure for every radiograph made, and that beyond certain limits there is risk of epilation and even a definite erythema. It requires little calculation therefore to determine the number of films that can be safely made. If our limit of safety has been stated as 300 r, and our maximum exposure not likely to average more than 20 r, then one might presume fairly definite safety if the number of exposures in a limited time of say, three or four days, does not exceed 15. We know also that x-rays are dissipated at such a rate that within a period of one week approximately 50 to 60% of the skin exposure is reduced, which would indicate that if it were absolutely necessary, approximately half this number of films could again be made one week after the date of the last exposure.

The safety factor as far as the patient is concerned can be improved by the use of filtration, and by using slightly longer anode-film distances. Here again, Martin of London has stated that by adding a filter of 1 mm.Al, it is possible to obtain a reduction in skin exposure of 55%, with a reduction of the actual film exposure of only 30%. It might seem on first observation that this would have quite a marked effect upon the quality of films obtained, whereas actually if the technique employed is correct, no appreciable difference would be noted. For example, other factors remaining constant, one obtains a 25% reduction in film exposures by reducing the time factor from 4/20 to 3/20 of a second, and it is a common experience that such a change is not readily discernible on the finished film. Most modern tubes have an inherent filtration equivalent to ½ mm.Al. Consequently, by adding ½ mm. clinical filtration it has been found that the reduction in skin exposure amounts to approximately 26%, and the reduction in film exposure is correspondingly lower. Hence, it is seen that by using slight added filtration the safe number of films can be increased by about one-quarter.

The same observer also drew attention to the low skin exposure during chest radiography, and he rightly attributed this finding to the customary use of long anode-film distances in chest technique. This becomes quite evident when one remembers that an increase in distance from 35 to 40 inches will result in a diminution of the film exposure of almost 25%, and that again this slight increase will not alter the quality of the film, providing of course, the other technical factors are correct. It will consequently be seen that by the judicious use of added filtration, and slightly longer anode-film distances, it is possible to reduce the actual skin exposure almost 50%.

It is a common experience in every x-ray department to see technicians seek protection from an exposure which is being made by stepping behind a thin partition or ordinary wooden door. This always reminds one of an ostrich sticking its head in the sand! Ordinary materials of construction are of little or no protection from an x-ray beam. Robertson, in his volume, "Radiology Physics," noted that using a potential of 78 kv. the required protection in lead should be equivalent to 1 mm.; and for 200 kv. this equivalent should be as high as 4 mm. He noted in this latter instance that a thickness of iron to provide this equivalent would have to be 55 mm. (about 2 inches), and for ordinary structural concrete, a matter of 275 mm. (about 11 inches). If such is true, one will quickly recognize the futility of seeking protection behind an ordinary wooden door or plaster parti-

tion. As a matter of fact, if materials of construction are not sufficient to absorb a beam, they result in additional scattered radiation which is all the more serious as the wave length of any beam is lengthened in proportion to a certain function of the angle from the primary beam, and becomes more and more damaging to the superficial tissues. Scatter also takes place from the patient and x-ray equipment (tables, etc.). No doubt every technician has noticed that during the process of taking over-the-table films in a darkened room (such as following G.I. investigations) how brilliantly the fluoroscopic screen will become illuminated during the exposure. Much of this is due to scatter.

Coming back to our original estimation of the exposure during a simple a.p. film of the abdomen which we noted as about 4 r, we found that if iometer readings were made at a distance of 1 foot directly opposite the middle of the table, our readings amounted to about 1 r. A good deal of this must have been due to scattered radiation. At 2 feet, the exposure amounted to about ¼ r, and if the same physical principles are applied one would expect an exposure of about 1/9 r at a distance of 3 feet. It becomes evident then that in any radiographic room, the more materials which are exposed, the more will be the amount of scattered radiation and the greater will be the angle at which the scatter takes place. This last has been noted on many occasions in departments where extremely large numbers of films have been made, such as during the taking of induction chest films for the armed services, where fairly appreciable quantities of radiation were noted even directly behind well constructed and shielded tubes. Of course this quantity increased rapidly as readings were taken more and more anteriorly and nearer to the chest stand.

If it is conceded that one of the greatest dangers to x-ray personnel is the exposure to scattered radiation and that such a condition is increased by both exposure of the patient and materials of construction, then it must be evident that if such surface exposures are diminished to a minimum consistent with the areas to be radiographed, such a danger can be further reduced. For example, an ordinary cone with a 5-inch aperture will cover a film area of about 1 sq. ft. at 40 ins. At 6 ft., such a cone would expose a surface of somewhat over 3 sq. ft. Consequently in routine chest radiography it will be readily recognized that this comparatively small area of a room capable of emitting scattered radiation is to be preferred to a large part of the whole surroundings if no cone is used.

A significant proof of this fact must be the common experience of all technicians who may have observed the diminution in illumination of the fluoroscopic screen when over the table radiographs are made, using a small cone, as compared with the degree of fluorescence when no cone is used. We found that iometer readings made 1 foot from the table using a small cone for the usual exposure of an a.p. abdomen amounted to ½ r as compared to 1 r without the use of a cone. At 2 feet, the exposure amounted to 1/8 r. At 3 feet consequently the exposure would be expected to be in the vicinity of 1/18 r. Following this reasoning, at 6 feet from the table, which is frequently quoted as a so-called safe distance, one would expect an exposure of 1/72 r. If such is the case, it requires little calculation to determine that if 12 over-the-table films have been made following, for example, G.I. investigations, 12/72 or 1/6 r. would have been absorbed by a technician standing at this so-called "safe distance." It was mentioned that the average daily exposure to personnel should not exceed 1/7

to 1/6 r. Consequently, if gastric work is done first thing in the morning, that technician should not receive any further exposure during the whole of the remaining day's work.

It should be mentioned that many of the accidents in the early days of radiography resulted from relatively low kilovoltages and long exposure times. We feel that the use of higher kilovoltages and relatively short exposures do not appreciably increase the skin dose, whereas the relatively shorter wave lengths provide less surface absorption on the skin.

A very important aspect of this work is exposure during fluoroscopic examinations. Here again many of the principles above will apply. There is a great variation in the skin exposure among various types of equipment, depending upon the milliamperage used, the anode-skin distance, use of very small apertures, etc. With a low milliamperage and at least a 10-inch distance the dose should be low, probably a good deal less than 10 r per minute of continuous exposure. We have found that from 2½ to 3 Ma. at 75 kv. is adequate for good visualization, and the dose on the patient's skin averages about 4 to 5 r per minute. If the output is definitely known, then of course the figures for maximum safety (i.e., 300 r) can be applied, and the maximum time limit deduced. If no accurate measurements have been made, one should not anticipate more than 20 r at the utmost, in which case the maximum continuous exposure should not exceed 15 minutes. Needless to say, in the hands of a skilled operator, this time period would not exceed 5 or 6 minutes. Proper consideration should be given to the number of spot films made, and this would hardly likely exceed more than 2 or 3 r per film. In respect to fluoroscopy, perhaps the most important problem is the proper use of the mobile unit. This should never be permitted except under the operation of a member of the x-ray staff. It is absolutely imperative that the distanct from the tube head to the patient be maintained at not less than 10 inches, and if a frame or tunnel provided with an aluminum filter and shutters is available, this should always be used. No portion of the surgeon's or technician's anatomy should ever be visible on the hand screen, and all manipulations should be carried out and completed before energizing the unit, the mobile fluoroscope being used only to check results. We have made it a habit to use the hand timer, permitting a total exposure equivalent to a time twice around the dial, which is a matter of 20 seconds in all. This is admittedly a very short total duration, but unless such a scheme is used the importance of maximum care in operation may be disregarded. Another very important factor is that the hand screen must always remain directly on the frame or tunnel atached to the tube head, as it must be remembered that the tube in a mobile unit does not move synchronously with the screen as is the case on a large stationary unit. It should be repeated again that a mobile unit is perhaps the most dangerous piece of equipment in the department's armatorium and should NEVER be left to the devices of untrained and technically ignorant personnel. It should also be emphasized that all of the many principles discussed above, such as time, distance, kv., use of filters, etc., apply in this instance.

Some important considerations are somewhat beyond the scope of this paper. To mention a few, the proper installation and shock-proofing of equipment, the planning, location and construction of an x-ray department with ample and safe

storage space, the proper use of anaesthetics, etc., all of which together with many other related subjects have been repeatedly discussed in text books and journals.

There are, however, some definite responsibilities for the hospital and the administrators of the various departments. There should be adequate ventilation for an x-ray department. This should be sufficient throughout the various radiography and therapy rooms and especially the dark room. Besides being well aired, this latter should be of such a design that it can be completely opened to sunlight or outside air, at least when not being used. It has been recommended that the operating rooms in an x-ray department should have high ceilings and a volume of approximately 3000 cu. ft., in a room of which size provision should be made for a complete change of air at least 6 times per hour; and it is more than usually necessary to install a special fan for this purpose. The temperature in which personnel work continuously should be at 65°F.

Important, too, is the maintenance of the best possible physical condition of all personnel. Technicians should never be required to work day after day to the point of fatigue or at tasks where a degree of exposure is likely to be at a maximum. If such is taking place, it is obvious that the staff should be increased so that proper rotations can be worked out among its members; in such rotations should be a provision for at least a full hour of complete rest sometime about the mid-day (that is in addition to time for the noon meal). It is recommended, too, that provision should be made for a light lunch in mid-morning and mid-afternoon.

The importance of an adequate vacation cannot be over-emphasized, and here again the International Congress of Radiology has recommended four weeks in the summer, preferably to run concurrently, the time to be spent as much as possible in the open air with adequate rest. This principle can be enhanced by the use of vitamins throughout the year, and we have made it a point to find a preparation which will provide sufficient prophylactic therapy in one capsule daily. This last point is of some significance because if such a preparation is put in the department for use, almost every one at least some time during the day will have assimilated the required supplement, whereas, if preparations requiring 3 or 4 capsules daily are necessary, it is found that not infrequently only a portion of the treatment is remembered.

Conclusions:

1. There is an appreciable dose of radiation absorbed by the skin of patients, and technical staff, during ordinary routine radiography.

2. There is a definite limit beyond which this dose cannot be carried without the risk of temporary or permanent damage, consequently there is a limit to the safe number of films which can be made on any one patient in a given length of time.

3. The dose absorbed by the skin of a patient can be appreciably reduced by slightly increased anode-skin distances, and the use of added clinical filtration.

4. Much potential danger results from scattered radiation. This can be minimized by the proper use of cones; ordinary materials of construction are not adequate protection against radiation.

5. Danger is emphasized in the use of mobile fluoroscopic and radiographic units.

6. Proper conditions with regard to working hours, rest periods, vacations, etc., are essential for continued health.

Electronic Medley

By L. A. LUDWIG, R.T.
Victoria, B.C.

IF the speed of electricity be 186,300 miles per second and if the current is a movement of electrons, how can the individual electron afford to crawl along at the snail's pace of 5 feet during an entire hour?

Riddles such as this example go to make doubly fascinating an already interesting subject — the science of electronics! The answer to the above is, that while electrical current is in fact a flow of electrons and the current does travel at the speed of 186,300 miles per second, this high speed is not attained by any individual electron, but rather, each electron in line gives to its next fellow a vigorous "push." These pushes, repeated in rapid succession along the length of the conductor like a row of falling dominoes, cause a portion of the original energy to be delivered to the terminus of the conductor.

How do electrons behave when strictly "at home" in the atom? Investigation into the privacy of the atom required more than a search warrant from the sheriff's office. Countless difficulties blocked the entrance to this knowledge.

Widely separated scientists methodically recorded discovery after discovery, many of them seemingly insignificant at the time. Research and amalgamation of scientific facts by key physicists resulted in a battering attack into some of Nature's innermost strongholds. Secrets of tremendous importance were wrested from hitherto unapproachable places. Hypothesis led to theory. This theory has now become the authority and foundation upon which is based the construction of electronic apparatus of every type.

How small is tiny? The human mind is simply not capable of grappling with ultra minute dimensions and they tend to become a mere mathematical figure. To draw a more understandable picture of the relative size and weight of the chief occupants of the atom, one authority invites us to imagine a single hydrogen atom enlarged to the size of the earth—25,000 miles in circumference at the equator. The proton in the centre is an iron sphere about the size of a football, weighing 100 lbs., while the electron at the circumference is a 2 oz. balloon of the same size. This picture makes it easier to understand why some physicists, involved in atom smashing research, bombard with the "battleship gun" proton in preference to the "22 rifle" electron.

Allowing even for the more thickly populated atoms such as go to make up the heavier elements, it becomes possible to see that a tourist electron on its passage through a foreign atom, would not require a first class ticket to avoid rubbing elbows with any of the continually moving resident dwellers. Indeed, it would seem that the chances for a collision are remote.

Even so, collisions do occur—and when atomic inhabitants tangle, things happen. It required energy to set the electron in motion originally. This energy remains a potential and can be imparted to other bodies or expended in the form of heat. Thus, tenant electrons can be ejected from the atom or merely knocked off their course, perhaps in turn to collide with still another tenant, till all the energy of the original collision is expended.

Some physicists now state that the transformation of energy and vice-versa is a distinct possibility. The older theory

teaches that, in electrons we are dealing with a corpuscular body or substance of matter, and that in the photon or quantum, of electro-magnetics, energy exists in non-corpuscular form only and that these are always of separate identity. That is, the electron is separately recognized and has measurable size and weight, while energy is by its nature an abstract thing.

In the production of x-rays, we are dealing with a non-corpuscular or "not composed of matter," form of energy.

In the electrical transformer, the energy on the primary side is the potential of the moving electrons, which are of corpuscular identity. In the secondary coils, this is again so. However, between the two coils a non-corpuscular form of energy is activated by the change in wave form of the electronic movement on the primary side, to stimulate in turn the "sympathetic" flow of electrons on the secondary side, which constitute the electronic current. There is no exchange of electrons from the primary to the secondary coil.

The electron is bound to its orbit within the atom by a delicately balanced force, for the centrifugal pull of its elliptical motion is perfectly adjusted to the attractive force of the oppositely charged nucleus. Heat will interfere with this balance, giving the electron an ever wider scope of motion, until only a moderate force can send it completely out of the boundaries of the atom. This valuable property is utilized in all manner of electronic apparatus and of course, in the filament of the x-ray tube.

Electrons can also be knocked out of the atom by non-corpuscular, electro-magnetic quanta, different elements responding most effectively to certain wave lengths. A good many elements are sensitive to the wave length of x-radiation, some producing fluorescence. Other elements react especially to ultra-violet, to visible radiation, or to infra-red.

Photo voltaic (photo electric) cells of the cesium oxide and copper oxide type, being sensitive to radiation of the visible spectrum, are useful in light intensity measuring instruments. When light strikes the oxide surface of this cell, there is effected a release of electrons from oxide to the copper, flowing in quantity according to the amount of light stimulation. The current is said to flow from the copper to the oxide, the opposite direction to the electronic movement. This confusion of opinion is still taught in current technical works, although its theories have been superseded by present day knowledge of the behaviour of the electron.

Concerning our electronic future, many authors have been expansive in describing the wondrous things we should experience in a decade or two. What ten years of time will bring remains to be seen, but it seems certain our knowledge of the electronic tool will be increased. The apparatus at our disposal will be improved technically, even if these advances are only natural competitive improvements based on present knowledge.

Meanwhile, we x-ray technicians, in our field of endeavour, need not neglect the development of our skill. The correct anatomical positioning of part in relation to tube and film is still tremendously significant. No apparatus for definite simplification of this all-important radiological procedure awaits on the electronic horizon.

The Focal Spot

Journal of the Canadian Society of Radiological Technicians

EDITOR
LESLIE J. CARTWRIGHT, R.T.

Volume 5 TORONTO OCTOBER 1948 *Number 4*

Editorial Comment

WITH this number we complete the fifth volue of The Focal Spot. How time flies! Twenty issues of the journal of the Canadian Society of Radiological Technicians have been published since the magazine was first launched in January, 1944, and these in themselves constitute a fairly complete history of the Society during that period. However in this issue we publish the first instalment of a very excellent and comprehensive History of the C.S.R.T., prepared by Sister deLellis Crowley of St. Joseph's Hospital, Saint John, New Brunswick. With the thought that some members might wish to preserve this History as a unit, we are printing this in the middle pages of the magazine which can be easily removed and filed separately. The balance of the article will appear in the next two issues.

In the July issue of The Focal Spot we stated that we expected to have more space for technical articles in the next two or three issues. This statement has been nullified to some extent by the receipt from the Registrar of the Official Registry of the C.S.R.T., giving the names of all fully registered members of the Society. It will be recalled that a resolution that this should be published annually in The Focal Spot was passed at Saskatoon in 1947. This takes ten pages, which is quite a lot of space. We feel sure that it will be found to be very useful, although whether it should be published in The Focal Spot or in a separate booklet is something else again.

The C.S.R.T. History, while not a technical article, is an important document and we urge the younger members particularly not to skip it but to read it carefully as it will be found to be most interesting.

In an effort to overcome, to some extent, this considerable demand on our space we have widened the columns slightly throughout the magazine and narrowed the spacing in some of the articles.

We are making another atempt in this number to start a correspondence column. We feel that this could serve a useful purpose in airing controversial points and in assisting the officers of the society to size up the opinion of the membership on such points before action is taken on them.

The scrutineers at the recent election for Secretary-Treasurer of the C.S.R.T. report that 172 ballots were received and Mr. W. Q. Stirling was elected as Secretary-Treasurer for 1948-49. Congratulations to Mr. Stirling — or should it be commiseration? when one thinks of the amount of work involved in this position. All communications to the Secretary-Treasurer should now be addressed to Mr. W. Q. Stirling, 1416 West 14th Avenue, Vancouver, B.C.

Mr. James Connell, R.T., of the Medical Arts Clinic, Regina, headed a group of local volunteers who rendered great help to the Secretary, Mr. P. E. Hunt, in addressing and mailing nearly 500 ballot sheets for the election of the new Secretary-Treasurer.

A letter has been sent to the Secretaries of all Provincial Societies notifying them that the new annual membership fees authorized at the last annual meeting become effective 1st January, 1949.

We presume the membership will want a 1949 Focal Spot Calendar in the January issue, as it seems to have been considered worthwhile for the past three years. The Editor, however, has practically exhausted his fund of tables, so if any reader has some useful tables or formulae he would be doing us a considerable favour if he would send them in right away.

SOME
HISTORICAL CONSIDERATIONS

OF THE

CANADIAN SOCIETY

OF

RADIOLOGICAL TECHNICIANS

BY

SISTER MARY deLELLIS CROWLEY, B.Sc.,R.N., R.T.

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THESIS PRESENTED TO THE FACULTY OF THE SCHOOL OF NURSING OF SAINT LOUIS UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN RADIOLOGIC TECHNOLOGY.

1948

Some Historical Considerations

INTRODUCTION

IT is now generally recognized that radiology and its application to medicine has probably contributed more to the relief of suffering humanity than any other science. The importance of the technical aspects and the role of the x-ray technician in the remarkable progress of radiology has not been appreciated even by technicians themselves. Today, however, the value of an adequately trained radiologic technician is becoming more apparent. It is generally recognized that the technician must possess a high degree of technical skill in order to render more efficient service to the patient, and to be a more useful and intelligent assistant to the radiologist. In order to fulfill these requirements a standard curriculum must be provided which will furnish two types of learning, namely, those peculiar to the classroom theory and those associated with adequate practical experience. It is necessary, therefore, for educators in this field to be aware of the deficiencies in the training offered in the past, and to realize the urgent need for greater effort in the future. In the education of the radiologic technician one unavoidably encounters change within a world that is ever-changing. This need for better education of technicians has brought about the organization of specific groups interested in this vital problem. One of these. organized in 1942, is the Canadian Society of Radiological Technicians.

PURPOSES OF STUDY

Since, to the knowledge of the writer, no history of this organization has been published, this work has been undertaken with the following objectives in view: first, the compilation of data to record the developments and marked progress of the Society during the early years of its existence; secondly, to secure a wider, personal, and more intimate knowledge of the organization.

The problem of this thesis, therefore, consists in tracing the historical development of the Dominion organization from the first provincial organization meeting in Manitoba in 1929 to the present time. Since the history of the Canadian Society of Radiological Technicians is so closely interwoven with the education of the radiologic technician, tracing the history of the organization will in a large measure indicate training facilities offered to radiologic technicians and the manner in which they influence the development of an incorporated society. Such an account will serve to preserve for members of the Canadian Society of Radiological Technicians some historical consideration of lasting interest.

SOURCE OF DATA

The procedure involved the collection of data from the following suorces:

1. Literature related to the discovery and science of radiology.
2. Correspondence with Percy E. Hunt, Secretary-Treasurer of the Canadian Society of Radiological Technicians.
3. Correspondence with Dr. E. A. Petrie, who is Chairman of the Board of Examiners for the Canadian Society of Radiological Technicians, a former member of the Board of Directors of this Society, and a member of the Canadian Association of Radiologists.
4. Questionnaires sent to the Secretary of each provincial society.
5. The official journal of the Canadian Society of Radiological Technicians—*The Focal Spot.*
6. The official journals of the American Society of X-Ray Technicians and the British Society of Radiographers.

Through the assembly of these accumulated facts,[1] the writer has made an effort to work the data into an historical account of the beginning and development of the Society. As such a report, it should inspire the present members of the Society, and its future members as well, with deep respect and loyalty for those who laid its foundations, and make them zealous in the accomplishment of their work, as true apostles of mercy, in the service of the sick.

NOTE: (1) An earnest effort has been made by the compiler of this history to contact the early members of the society, as well as others who might contribute pertinent information. If omissions have inadvertently occurred, this has been wholly unintentional and is to be deeply regretted. It is hoped, however, that credit and honor have accurately and justly been bestowed.

Sister Mary deLellis Crowley

CHAPTER I
HISTORICAL CONSIDERATIONS

Roentgen's Discovery of the X-Ray

On November 8, 1895, Wilhelm Conrad Roentgen discovered a new form of radiant energy while experimenting in his laboratory at the University of Wurzburg in Bavaria.[48] Using the mathematical symbol "X" for the unknown radiation, he called his discovery the x-ray. In honor of the discoverer, x-rays are frequently referred to as roentgen rays.

The news of the momentous discovery of this new form of energy travelled with unusual rapidity far and wide. As a result physicists in their laboratories all over the world worked feverishly on experiments with this new kind of ray.[22] In America roentgenograms were made as early as January, 1896. It is thought that Professor M. I. Pupin, of Columbia University, produced the first roentgenograms in the United States, which was January, 1896.[19] In Canada Professor J. Cox of McGill University was an early pioneer in this new science.[22] It is interesting to note that, according to Evans,[19] the first report of the medicolegal use of x-rays was made in Canada. In this case the examination was made by Professor Cox on a leg for a shot injury, and reported in the *Canadian Medical Review*, April 4, 1896.[19]

Period From 1895 to 1914

The importance of the use of x-rays in the field of medicine was realized almost immediately after their discovery. The world-wide enthusiasm over this new type of radiation is shown in the collection of Glasser:

> **I have been able to collect over a thousand articles on x-rays which appeared in scientific journals during the year 1896. Over fifty books on the same subject were published in the same year, not to mention innumerable comments . . .**[23]

In reviewing the literature it is interesting to note that these ambitious pioneers could perform almost as many types of roentgenographic examinations as are done to-day. These examinations, of course, were in the experimental stages. The equipment, too, was extremely limited in capacity and efficiency as compared with that available at the present time. Penetrometers, for measurement of the quality of radiation, were introduced as early as 1903.[20]

In 1896 the value of roentgenography in military surgery was conceived when it was used by the Italians and British.[36] During the Spanish-American War in 1898, x-rays were used to demonstrate various types of fractures, the location of bullets, and the character of bone lesions.[3] According to Borden [3] the percentage of recoveries in this war was proportionately greater than in any preceding war. Under the guidance of the roentgen ray extensive exploration of wounds for bullets was reduced, thus lessening the spread of infection through the tissues.

Considerable confusion arose during this period of radiology due to the deleterious effects on many who were unduly exposed to x-rays. Different degrees of dermatitis, epilation, anemia, and skin cancers began to develop among the pioneers.[5] Fortunately, this state of ignorance was short-lived and the necessity for protection was early realized. It was not until World War I, however, that methods of protection were carried out in a methodical manner.[50]

Influence of World War I

World War I brought many new developments in medical radiology. Progress was noted in standardized training courses, improved equipment, and specialized roentgenographic procedures. At this time all x-ray work in military hospitals was placed under medical roentgenologists.[10]

In addition to the special training given to roentgenologists during the war, short intensive courses were given to army technicians, who were called manipulators. Their work consisted in the handling of films and the care of the equipment.[36] A well recognized textbook published at this time was the *United States Army X-Ray Manual*,[49] which was valuable for both roentgenologists and technicians.

The invention of the hot-cathode vacuum x-ray tube by Coolidge in 1913 [31] revolutionized roentgenography. This tube enabled the operator to have a much better control on the output of the tube than the gas tubes formerly in use. Other equipment which added to the progress of radiology included the devices to eliminate secondary radiation. Albers-Schoenberg [32] early recognized the value of a compression diaphragm; the principle of which was later improved by Bucky,[6] and in 1916 brought to greater perfection by Potter.[43] Single-coated

nitrate base x-ray film [39] which was available in 1914 brought great improvements in technique, as also the newer type of Snook transformer in 1915,[33] and in 1916, the Patterson intensifying screens.[31]

The development of special roentgenographic procedures was a natural result of these new inventions. Dandy published his first work on ventriculography [12] in 1918. and encephalography [13] in 1919. Interest was also taken in uterosalpingography [9, 47] and female pelvimetry,[37] as well as improved technique in the study of the sinues and mastoids.

Subsequent Developments

Amazing progress has continuously been made in the field of radiology since the day the world was startled at the report of an x-ray examination of a hand. The developments in the past two decades are due chiefly to the result of widespread research and high-powered shockproof equipment. With the increased knowledge in this field, x-rays are now used universally both in diagnosis and in treatment. To-day all efficient and approved hospitals are equipped to carry on work in this field under a qualified radiologist. Since all specialties in medicine and surgery are making ever-increasing demands on the department of radiology, it is essential that provision be made for a satisfactorily equipped x-ray department and a well trained personnel. According to MacEachern:

> **The department shall be under the supervision of a competent medical radiologist assisted by trained technicians. (35)**

This recommendation is one of the requirements for hospital standardization by the American College of Surgeons.

During World War II x-rays again played an important role in military roentgenology. The routine x-ray examination of the chest on all men inducted into the armed forces was an inestimable benefit for the individuals as well as for economic reasons. To facilitate this procedure photo-roentgen units were installed in several sections of the country.

A new application of x-rays is in the field of industry to determine hidden defects in metals and other materials which are used in industry and for military purposes.

CHAPTER II
NEED FOR ADEQUATELY TRAINED TECHNICIANS

The beginning of the radiologic technician's era dates back to World War I. Prior to this time the roentgenographic examinations were made by the physicists and physicians interested in this new field. In keeping with the rapid strides in the science of radiology in its application to medicine, the need for trained technical assistants became evident. Most of the technical work at this time was disorganized and unrelated due to the inflexibility of technical factors on rather crude equipment. One of the first men who set the groundwork for a systematic approach to the problem of teaching roentgenographic technique was Ed. C. Jerman, the founder of the Educational Department of the General Electric Corporation. The textbook published by Jerman in 1928—*Modern X-Ray Technique* [34] — was, at that time, a valuable guide to technicians, although earlier books, such as those by Prince,[44] and the United States Army [49] were already in use. To-day the more complicated procedures demand even a higher degree of skill on the part of the radiologic technician. Therefore, more didactic training is imperative so that the technician will be enabled to produce consistently diagnostic roentgenograms under all conditions.

Organization of the American Registry of X-Ray Technicians Sponsored by the Radiological Society of North America

Members of the Radiological Society of North America appointed a committee in 1920 [24] to study methods for the official recognition of radiologic technicians. This committee favored the establishment of a Registry to enable technicians to become certified. Under the joint sponsorship of the Radiological Society of North America, and the American Roentgen Ray Society a plan was formulated in 1922, and was functioning as early as 1923. Ed. C. Jerman was appointed as Examiner and did a great deal towards the training of technicians. Later Alfred Greene, in his office as Executive-Secretary, also added much to the success of this organization. The Council on Education and Registration was appointed in 1931.[51] This council, composed of radi-

ologists and technicians, succeeded in raising the standards of the Registry by making the requirements more stringent. The official title of the organization was changed from the American Registry of Radiological Technicians to its present title, American Registry of X-Ray Technicians, in 1936. The Board of the Radiological Society of North America announced at their meeting in December, 1942, their willingness to relinquish their sponsorship of the Registry provided this sponsorship was assumed by the Americal College of Radiology. This sponsorship of the Registry by the American College of Radiology became effective on May 6, 1943.[25]

Through the untiring efforts of its members, the Registry showed its marvellous progress by the report of 4,600 registrants in the first twenty years of its existence.[25] In June, 1943, the American Medical Association assumed the responsibility of accrediting schools for training radiologic technicians.[25]

To-day the American Registry of X-Ray Technicians stands on a strong foundation. From the phenomenal progress it has made in the twenty-five years of its existence, its members can look forward to other great accomplishments which will assist them in the performance of their duties as radiologic technicians.

Organization of the American Society of X-Ray Technicians

The first meeting for the American Society of X-Ray Technicians was held October 25, 1920.[26] At this meeting a group of thirteen technicians, under the chairmanship of E. C. Jerman, met to discuss the organization of the American Society of X-Ray Technicians. The name of the Society adopted by the group was the *American Association of Radiological Technicians;* this title was later changed to the *American Society of Radiographers* in order to lessen the opportunity for confusion with the American Registry of Radiological Technicians.[27] Again, in 1933, another change was made in the title of the Society when it received its present name—*The American Society of X-Ray Technicians.*[27]

The chief object of this Society is "to promote the science and art of radiography."[1] Only candidates who were registered x-ray technicians were eligible for membership in the Society after 1925. At the annual meeting in 1929 the members present decided to publish an official Journal for the organization —*The X-Ray Technician.* Formerly, the publications for the Society were published in *Radiology.*[26]

From the original group of thirteen members, who organized the Society in 1920, the membership has steadily increased to 3,000 members in 1947.[46] The arduous labors and self-sacrificing endeavors of the organizers and leaders in the American Society of X-Ray Technicians have resulted in a well-developed, highly ethical organization, which has attained international recognition.

Organization of the British Society of Radiographers

The Society of Radiographers of England was founded in 1920,[40] and is affiliated with the British Institute of Radiology. Candidates are required to pass the examinations conducted by the Society, and to have had two years' experience in roentgenography before they are eligible for membership. Successful candidates receive a diploma as a member of the Society of Radiographers, and are entitled to use the initials, M.S.R.

The qualifications for Fellowship in the Society were drawn up by its Council in 1936. Candidates can be certified by three different methods, depending upon the experience of the applicant: (a) by thesis, (b) by ordinary examination, and (c) by special examination. This arrangement went into effect May, 1937, when the ordinary examination for Fellowship was held in London.

On the recommendation of the Council of the Education Committee a special course of instruction was introduced in the curriculum in order to qualify candidates in the field of radiotherapy. A special certificate is issued for the successful completion of this course.

Persons passing the therapy examinations shall be known as S.R.C.T. (Society of Radiographers' Certificate in Therapy). Persons passing the ordinary membership examinations shall continue to be styled M.S.R., but those who in addition pass the special therapy examination shall be known as M.S.R. and C.T.

The progress of the Society is shown by its increasing membership which in 1948 has reached almost 3,000.[62] The membership in this organization is extended to South Africa and New Zealand but the examinations for these countries are controlled by the board of examiners in England.[62] The object of the British Society of Radiographers is:

To promote the science and regulate the practice of Radiography and to consider and discuss all subjects affecting it."

The first publications for this Society were printed in the *British Journal of Radiology*. As the membership increased, its members decided to assume the responsibility of an official journal of its own. Accordingly, the first issue of *Radiography* appeared in January, 1935.

One of the outstanding members of the Society of Radiographers is K. C. Clark, who has become widely known through the publication of the excellent book she wrote on x-ray technique, *Positioning in Radiography*.[11] A review of this book in *Radiography* states:

The contents are encyclopaedic, and the lavish array of radiographs and diagrams are invariably excellent; some of them are magnificent.

It is gratifying to note what a high degree of proficiency can be attained by adept technicians.

CHAPTER III
THE RADIOLOGIC TECHNICIAN in CANADA

The development of the radiologic technicians in Canada, as elsewhere, has been an evolutionary process. Supervised training courses, adequate textbooks, and up-to-date shock-proof equipment were unknown to the early technicians. Through methods of trial and error, as well as experimentation, these pioneers became proficient technical assistants to the radiologists. It is due to their spirit of leadership and constant endeavors that so much has been accomplished for the radiologic technician of to-day in the science of roentgenological technique and the formation of local and Dominion organizations.

The need for the organization of societies for technicians was early recognized. In the United States and in England, as previously stated, national societies were organized in 1920, which were sponsored by their respective societies of radiologists. In the formation of the American Association of Radiological Technicians Canada was represented in the person of Claude J. Bodle of Winnipeg, Manitoba. Mr. Bodle, still an active member of this Society, was one of the organizers.[26] This Association is known to-day as the American Society of X-Ray Technicians.

Early Affiliation With the American Society of X-Ray Technicians and the American Registry of X-Ray Technicians

As no organization for radiologic technicians existed in Canada before 1929, several radiologic technicians sought and obtained membership in the American Society of X-Ray Technicians when it began to function. In 1929[68] the Western Society of Radiographers was organized by Claude Bodle and William Doern of Manitoba. This society became affiliated with the American Society of X-Ray Technicians March 5, 1930.[61] Owing to a change in the constitutions and by-laws of the American Society of X-Ray Technicians it was necessary for these societies to re-affiliate. Accordingly, the Western Society of Radiographers was re-affiliated November 21, 1938.[61] In September, 1940, the name of this organization was changed to the Manitoba Society of X-Ray Technicians.[68] Following the organization of the Canadian Society of Radiological Technicians in 1943, the affiliation with the American Society of X-Ray Technicians was discontinued.[68]

The establishment of the American Registry of X-Ray Technicians, in 1922, aroused the interest of many Canadian technicians who received certification with this Registry after written examination. The official roster of the American Registry of X-Ray Technicians for 1947 shows the registration of 184 Canadian technicians.

Organization of Societies in Canada

In every nation-wide profession there is the necessity for some means of unification and official recognition in order to carry out the ideals of the profession. The recommendation of the American College of Surgeons for the employment of registered technicians in standardized hospitals is an example of this necessity for organization:

There are definite standards for the training of technicians and only those who are registered should be employed. (35)

The Canadian radiologic technicians were also cognizant of this need in their field of radiologic technique. Therefore, in order to provide facilities to qualify a greater number of radiologic technicians, a movement was made toward the organization of technicians' societies in Canada.

CHAPTER IV
PRELIMINARY STEPS IN THE ORGANIZATION OF THE CANADIAN SOCIETY OF RADIOLOGICAL TECHNICIANS

The Provincial Societies

The Dominion of Canada, which covers an area of 3,462,103 square miles, is composed of nine provinces which extend from the Atlantic to the Pacific coasts. In this large territory there are 921 hsopitals.[52] The technicians of the Province of Ontario, which had organized their society in 1935, realized that there was a vast field in Canada for the employment and activities of the radiologic technician. They became interested in the formation of a Dominion-wide organization for technicians in 1937. This followed an address given by Felix G. Reason, president of the Ontario Society of Radiological Technicians at the annual meeting that year.[66] A committee of three, Felix G. Reason, Mrs. Mary Cameron, and Ethel Pugen, was formed to explore the situation. Ethel Pugen was appointed chairman of this Dominion organization committee. A proposed plan and constitution were drawn up by this committee and presented by Dr. W. H. McGuffin to the Canadian Medical Association and the Canadian Association of Radiologists for approval at their joint meeting in 1938.[45] The plan for organization was approved, and Dr. McGuffin was appointed chairman of a "Technician Committee" for the Canadian Association of Radiologists.[38] In regard to the plan for organization Dr. McGuffin states:

The Canadian radiological technicians can gain much by banding together for mutual benefits in addition to establishing desirable relationships with the radiologists.[38]

It was felt that the first step toward Dominion organization was the establishment of provincial societies. Accordingly, letters were sent to all the provinces in 1939 by Ethel Pugen suggesting the organization of provincial societies.

In order to make this study more complete a resumé of the activities of the provincial societies is included. In Table 1, information concerning the year organized, initial membership, total membership, the number of active and student members, and entrance requirements is given.

Manitoba

When plans for Dominion organization were constructed the Manitoba Society of X-Ray Technicians was already well established. This Society was organized in 1929, with Claude J. Bodle of Winnipeg its first president. For several years this organization enjoyed affiliation with the American Society of X-Ray Technicians, as previously stated. At the time of its organization the Manitoba Society had an enrollment of twenty-five members ten of whom were registered technicians. At the present time the membership has increased to 152 members.

Ontario

The Ontario Society of Radiographers was organized in 1935 with a membership roll of fourteen. J. H. Coones was its first president. This organization progressed rapidly, and in 1948 the membership reached 275. It was through the arduous labors and outstanding leadership of the technicians of this organization that the Canadian Society of Radiological Technicians came into existence. The technicians of Canada owe deep gratitude to this Society for their untiring efforts to improve the status of the radiologic technician and the advancement of radiological technique. In 1939 the first provincial examinations were held for student technicians. Students in this province are required to have three years' training in radiologic technique before they are eligible for membership.

Alberta

The organization meeting of the province of Alberta in 1940, was under the chairmanship of Edward S. Hoare of Calgary. Due to the great distance to be travelled in order to hold central meetings, it was deemed advisable to have the organization divided into two parts: one group to be organized in Calgary, the other in Edmonton. In answer to the questionnaire sent to this province it was learned that the initial membership was between sixty and seventy, which, no doumt, includes both sections. At the first annual meeting in July, 1941, both the Calgary and Edmonton sections met to form the Alberta Society of X-Ray Technicians. The official publication of this group was the *Alberta Technician.*

In spite of transportation difficulties in this province to hold meetings, the membership of this Society has already increased to eighty members, forty-one of whom are registered.

The undiminished enthusiasm of the members, as well as the whole-hearted support of their radiologists, could only result in a greatly accelerated growth in this organization.

New Brunswick

The New Brunswick Society of X-Ray Technicians was organized in March, 1940. Sister deLellis of Saint John, the organization chairman, was elected the first president. Keen interest was shown by all the members in New Brunswick towards the formation of both provincial and Canadian societies for radiologic technicians. The membership in the New Brunswick Society, in 1948, has increased from the initial membership of sixteen to forty-nine. Much of the progress in this organization has been due to the whole-hearted co-operation of the radiologists, notably Dr. E. A. Petrie, representative of the New Brunswick Medical Society for this organization, and Dr. A. S. Kirkland, who gave valuable advice and assistance in the organization program.

The motto of this Society is: "Non nobis sed omnibus," — "Not for ourselves, but for others."

Nova Scotia

In May, 1940, the Nova Scotia Society of Radiographers was organized. Albert Perry of Halifax was its first president. The members of this organization merit commendation for their progressive activities in this Society. One notable feature is the annual three-day refresher course which has proved to be an excellent means for stimulating interest for both student and experienced technicians.

The co-founders of the Nova Scotia Society of Radiographers are Albert Perry and George Harrison, who have been awarded life membership in this Society in recognition of their leadership and initiative. From 1940 to 1948 the membership in this organization has increased from twenty-two to forty-four. galley SIX

Saskatchewan

The Saskatchewan Society of X-Ray Technicians was organized in 1940 under the direction of Sidney Johnson of Moose Jaw, who was elected the first president. The membership at this time was thirty-eight. During World War II the many technicians from this province enlisting in the service caused a considerable drop in membership. In May, 1946 renewed activity was evident in the Society; a membership drive brought the enrollment to seventy. Through the efforts of their competent secretary, Marie Peron, the drive was continued in 1947, which increased the total membership to ninety at the end of the year.

To meet the urgent needs in this province for laboratory-radiologic technicians a program was prepared for candidates to take short intensive courses in both these fields. Through the efforts of Percy E. Hunt and his committee a comprehensive program was presented to the directors of the Canadian Society of Radiological Technicians and the Canadian Society of Laboratory Technologists for approval, outlining the proposed plan. The combined training scheme is for the benefit of small hospitals, particularly in rural areas where one technician can carry the duties of the two departments.

Quebec

The Quebec Society of X-Ray Technicians came into existence in 1940 under the direction of Rosemary O'Hagan of Montreal, who was also its first president. The enrollment at that time was sixty members. Since then the membership has markedly increased; its total membership at present is 178. In addition to the active members there are thirty-eight students, twenty-eight associate and four honorary members. Recently a syllabus for training student technicians has been drawn up by this Society; this has been sent as a recommendation to the various hospitals and radiologists throughout the province, as well as to the Executive of the Canadian Society. Because of the bilingual nature of this province, the activities are carried out in both English and French; this, however, has been no hindrance to the rapid growth and success of their organization.

British Columbia

British Columbia is the youngest organization to date for radiologic technicians in Canada. At their organization meeting in May, 1943, William Q. Stirling was elected its first president. At this time there was an enrollment of forty members. Rapid strides have been made in the progress of this Society which at this time has a total membership of 140, fifty of whom are student members.

(To be continued)

The Training of Technicians

By DESMOND T. BURKE, M.D., D.M.R.
Sunnybrook Hospital, Toronto, Ont.

I WOULD like to outline some aspects of the problem of training a technician in the short time available to me this morning. It is generally conceded that the training is not sufficiently uniform or adequate in this country or perhaps in any other country to feel any too happy about the situation. On the other hand, we need not be particularly perturbed about it as it is a situation which must be faced by all young developing societies. You, however, have reached such a stage that it behooves you to commence what might be termed a long term plan towards some definite objective. At times it appalls one to consider how many things have to be worked out in great detail in order to make such a scheme successful. The magnitude of the work, however, need not alarm us if we make it a long term plan and make no attempt at a sudden abrupt change.

Let us consider first the reasons for desiring uniformity and a higher standard. The first and highest reason is that you as a member of a very important team in the treatment of the sick must provide a maximum amount of accurate information to the radiologist who in turn forwards his opinion to the clinician. You may not have a very personal contact with the patient, nevertheless your work is of extreme importance. You should have a feeling of satisfaction that all individuals passing through your department must owe you a great debt for the indispensable role you have played in the final outcome of their case. If you are to build up the proper spirit within an x-ray department and get away from ideas of things such as trade unionism, etc. — if you are to raise yourselves to the plane of professional people then your higher motivation must be some compensation for salaries which cannot be in keeping with the importance of your work, any more than the salary of a spiritual advisor is in keeping with the nature of his work.

Apart from that, you are not blind to the fact that a higher type of work increases your value and makes you much more indispensable from the radiologist's point of view. Though attempting a higher type of work will not be associated with promises of increased remuneration, you do appreciate the fact that increases are inevitable as a result of your more valuable role. Again it is necessary for you to keep an eye on the economic trends and consider the possibility of a more socialized scheme of the future. Any self-imposed implications, such as the implication of one of your members this morning that technicians can be trained in three months and should be paid after that time, might work to the detriment of yourselves in the future. Your position and status could hardly be compared with that of nurses and physio-therapists who undergo a more rigorous and longer training than you do at the present time and who receive salaries less than yours. You may be sure that in a nation-wide socialized system the background of all types of work and trade will be considered carefully in assessing salaries to be paid.

It is not necessary for us to enlarge on the problem of uniformity. Though our

*As given at Quebec Annual Meeting of C.S.R.T. in June, 1948.

country be large it is in the interest of each one as individuals and in the interest of training centres and hospitals as a whole that you attain a uniform standard across the country as a basic minimum for certification.

In view of the above, we feel that it is justifiable to increase the time and scope of your training in order that the results you obtain will be of a higher order. Such an increase, however, should not be nominal. It is of no value to give a three months' course of training and add to it on paper hours in different fields which are not followed. It should be viewed as the responsibility of senior technicians and radiologists that these courses are actually increased in their subject matter very considerably so that the technician who is turned out after a period of two years will have been subjected to approximately one year's work of actual teaching and one year's work confined to practical experience. These briefly are some of the reasons to justify our proposals.

Let us consider next some of the objectives which should be kept in mind.

They would be to develop:

(1) A standardized two year course for the qualification of R.T.

(2) Refresher and recent advances courses of about four weeks' duration for senior technicians.

(3) Special courses for those who are proceeding to higher positions in teaching and supervising capacities. It is possible that the latter course might lead to a University Diploma.

(4) Notes or text books covering all phases of radiographic training. It is felt at the present time that no text book does this adequately. For example, in the very important field of anatomy there are countless text books prepared for nurses, physiotherapists, doctors, etc., but none prepared with special reference to your necessities.

Let us consider now a few of the pitfalls which must be avoided. If anything is to be achieved it can only be done by the concerted action of your entire society. No effort should be spared to draw into the ranks of your society those technicians who at the present time remain outside for reasons of indifference, etc. Your senior directing society should encourage all local meetings and make it a point to have the subject of training of technicians on the agenda at all district and the annual meeting of the entire society. In this way objections, fears, doubts, etc., can be explained away and the results of experience at all centres can be pooled and used towards the development of the final uniformly satisfactory course. Senior technicians who have been practicing for years and whose experience will more than make up for long theoretical courses should be assured that any course being developed will not work out to their detriment in any way. One could hardly expect them to leave positions which they have held for a long time in order to go back for lengthy periods of training. In this way your senior experienced members will be more inclined to make valuable contributions to the subject matter of your courses.

While it is desirable for you to have as large a membership as possible you must see to it that certain ethical standards are adhered to, otherwise you can hardly expect the whole-hearted co-operation of the radiologists.

You should be careful not to be swayed to too great an extent by small enthusiastic bands of students or teachers across the country. Be sure that any method proposed is of such an order and in such places that a loss of enthusiasm or some eventuality such as a death of an enthusiastic leader would not result in an end to the course.

It is with this idea of continuity in mind that we pointed out the desirability of carrying on the physics courses at Technical Schools. Not only would we ensure continuity but we would also increase to a very great extent the number of training centres across the country as compared with the number which would be available should we confine our work to University Centres alone.

Though we favour the idea of developing and perfecting physics courses in Technical Schools it is felt that anatomy courses can be done adeyuately at University Medical Schools only. Until such courses can be done adequately at Uninumber of centres, anatomy will have to be taught as it has been at the discretion of the radiologist. This subject has been neglected a great deal in the past but with the increasing number of hours being spent on it by radiologists in training and by all other specialties, it is obvious that you as technicians must increase your knowledge of anatomy in order to demonstrate an increasing number of anatomical features in your film studies.

It is impossible in the time allowed to assess all aspects of your problems but we feel that if your motivation is good and the problem be attacked at once by all of you with co-operation and patience, in time you will ultimately develop a very much higher standard, a very much higher status and a degree of perfection in your work which will redound to the advantage of the sick, the doctors and yourselves.

Remember that Newman once said "Nothing would be done at all if a man waited until he could do it so well that no one could find fault with it."

Statement of Pool Fund—1948

Total Delegates' Expenses	$764.00
Amount Received from Donations	300.00
Quota for each Member-Society	58.00

Fares Paid to Quebec City		To be Refunded	To be Collected
Br. Columbia	$234.75	$176.75	
Alberta	154.80	96.80	
Saskatchewan	128.00	70.00	
Manitoba	121.50	63.50	
Ontario	43.30		$ 14.70
Quebec	10.00		48.00
New Brunswick	27.65		30.35
Nova Scotia	44.00		14.00
	$764.00	$407.05	$107.05
		Donations -	300.00
			$407.05

Due to certain errors in submitting the delegates' railway fares it has been found necessary to revise the previous Pool Fund Statement. The above is the corrected statement and, where found necessary, Secretaries of Member Societies are requested to remit to the Secretary-Treasurer, C.S.R.T., the amount called for so that payment may be made to those Member Societies entitled to such.

H. M. WELCH, Chairman,
Pool Fund Committee.

Therapeutic Technician's Approach to Patient

By CHRISTINE HOPPER, R.T.
Winnipeg Clinic, Winnipeg, Manitoba

WE all, at one time or another as student technicians, have argued vehemently against having to learn therapy. I was no exception. It was difficult to see why we should mix radiography and therapy. I vowed I would have no part of it. However, in the course of time, my mind was changed for me. As our department enlarged and a therapy unit installed I was chosen for the job, so decided to do my best, and in the following paragraphs I shall tell you what I have found.

At the beginning, I wish to say that this paper is primarily for those who do therapy or for would-be-therapists. We will not dwell on the physics or operation of machines because I realize that many of you have read fine articles written by technicians who have far greater knowledge of the subject than I. We shall deal, therefore, entirely with the technician's approach to the patient.

Human nature is much the same the world over whether you encounter it in an X-Ray Therapy Department or a Department Store. But primarily there is one difference in an X-Ray Department —you are dealing with persons who are ill. Illness makes greater demands on our cheerfulness, understanding and forbearance than anything I know. So you can well perceive how much a cheerful greeting and a pleasant smile mean to the sick person. A friendly approach dispels some of their fear and tends to put the patient more at ease.

An understanding of human nature is tremendously essential in therapy work. The wise therapist must visualize herself in the patient's position, and only then can she appreciate all his difficulties. So often a patient comes for his or her first treatment in a state of complete mental chaos. The understanding therapist can dispel little worries and fears by properly instructing the patient regarding the nature of the treatments and their probable reactions. When some unexpected reaction hits him it is well to prepare the patient beforehand, thus saving him hours of anxiety.

"Patience is a Virtue"—and in therapy a truer word was never spoken, particularly when dealing with difficult patients. There will always be one black sheep who persistently arrives late for his appointment, thus upsetting the morning's work, and there are always one or two who appear for the first treatment and then do not turn up for a couple of days. To overcome some of these difficulties it is well to have an appointment card with the daily appointments and a good chiding for missing them. It is wise to stress the importance of consecutive treatment. The therapist can help enormously by arranging treatment times to suit the individual so that mothers are free to look after family meals, and fathers to go to work. This is greatly appreciated and will do away with tardiness.

* Presented at the Sixth Annual Convention, C.S.R.T., Quebec, June, 1948.

CHRISTINE HOPPER, R.T.

In this fast-moving world of ours we are all speed-conscious, and in our rush we are apt to sacrifice the personal touch. Did you ever wonder how patients feel about impersonal handling? If you have been a patient yourself, among strange surroundings, you will realize what it means to have someone bend over you with a reassuring smile. Encourage the patients to chatter and air their little troubles. One can always spare a few extra minutes to lend a sympathetic ear.

In conclusion, I would like to say this to the would-be-therapists and students, if you are not genuinely interested in your fellow man and cannot practise the Golden Rule, it is inadvisable to take up therapy.

News Items

Halifax Infirmary School of X-Ray Technology

We have received a copy of a well-printed pamphlet describing a course in "X-Ray Technology" given at The Halifax Infirmary, Nova Scotia. In view of the interest at the present time in the formation of properly accredited schools for training x-ray technicians we feel that our readers will be interested in reading what has been accomplished at Halifax. The following is a summary of the information in the official pamphlet:

The Halifax Infirmary School of X-Ray Technology was established in 1933. It is under the direction of a full-time Certified Radiologist. Its technical staff is composed of Registered Members of the Canadian Society of Radiological Technicians who are also Registered Nurses of the Canadian Nurses' Association. The School is affiliated with the Halifax Infirmary School of Nursing, Mount St. Vincent College and St. Mary's College of Halifax, Nova Scotia.

Since Radiographic procedures are becoming more and more complicated and involved and since the use of X-Ray is invading practically every field of medicine, a minimum of two years' training is needed for both instruction and practical application in order to insure the student's reactions to circumstances both routine and unusual and to create in the student's mind the progressive trend of thought in applying the principle of medicine.

The two year course includes a four month preliminary period. Acceptance at the end of this period depends upon the student's rating in theory, practical ability, aptitude and personality, and if these are not satisfactory the student is asked to withdraw from the school at this time.

Upon satisfactory completion of the Course, the student will be permitted to write the examinations set by the Canadian Society of Radiological Technicians: Success in these examinations entitles the student to membership in the C.S.R.T. — (Registered Technician) — and to practice in any part of Canada without further examinations.

(If the technician at the time of writing is not yet twenty-one years of age, the C.S.R.T. reserves the right to withouthold the certificate of membership until she reaches that age.)

Space unfortunately does not permit us to give the Curriculum in detail but it is interesting to note that in addition to the usual theoretical subjects, 20 hours each are given to Introduction to Medical Science, Ethics and Psychology; and 16 hours each to Aseptic Technique in Relation to Surgical Radiography, Speech and Physical Education. There is also a weekly Discussion Club. The course is under the direction of Dr. C. M. Jones, Director of the Department of Radiology, with Sister Mary David as Assistant Director and Sister Edmund Campion and Miss Neva Harley as Instructors.

News Items

Dedication of the William D. Coolidge Laboratory, General Electric X-Ray Corporation, Milwaukee, Wisconsin.

On September 13th, at Milwaukee, more than 1,500 persons witnessed the dedication of the world's largest x-ray development laboratory to Dr. William D. Coolidge, x-ray pioneer, and director emeritus of the G-E Research Laboratory, Schenectady, N.Y.

Included among the guests were 200 x-ray specialists enroute to the annual convention of the American Roentgen Ray Society in Chicago, 1,100 employees and their families and friends, and 200 industrial leaders, physicists and research scientists.

The medical profession paid tribute to Dr. Coolidge at the ceremonies through Dr. Arthur C. Christie of Washington, D.C., internationally known radiologist, who recalled Dr. Coolidge's "revolutionary contributions to the science of x-ray" and praised him for his "modest and unpretentious acceptance of honors far beyond what most men can achieve."

Among distinguished guests atending the ceremonies were Dr. Paul C. Abersold, director of the Isotope Division, Atomic Energy Commission, Oak Ridge, Tenn.; Dr. Lauriston Taylor, director of the X-Ray Laboratory, National Bureau of Standards; Dr. A. O. Hampton, Director of Radiology, Veterans Administration; and Dr. E. P. Pendergrass of Philadelphia, president of the American College of Radiology. Among the Canadians present we notice the name of Dr. Carlton B. Pierce of McGill University and the Royal Victoria Hospital, Montreal.

In delivering the principal address of the dedication, Dr. Coolidge revealed that a new era in x-ray diagnosis may be ushered in soon when electronic means of intensifying the x-ray image are perfected.

He cited the need for a "much more sensitive receiving system than the simple fluoroscopic screen or intensifying screen and film," and reported that "much effort is being devoted to a study of various electronic methods of intensifying the screen luminosity. Of these, the combination of fluorescent screen and electron image tube would seem to-day to be the most promising."

M. J. Gross, Vice-President in Charge of Engineering, for G-E X-Ray Corp., called the audience's attention to such outstanding features of the new laboratory as the high-voltage experimental section, isolated from the remainder of the building by concrete walls 25 feet high and 3 feet thick at the base. Among units on which work is in progress in this section is the 2,000,000-volt x-ray machine, hitherto used solely in industrial inspection, but soon to be applied to the therapy of deep-seated cancers at a New York hospital.

Development of the multi-section tube used in the 1,000,000- and 2,000,000-volt x-ray tubes was one of the major contributions of Dr. Coolidge to the science of x-ray. His other achievements included the development of ductile tungsten in 1908, which paved the way for the modern incandescent light bulb, the modern automobile ignition contact, and the modern dependable x-ray tube. He also pioneered the development of portable x-ray outfits for the armed forces, and self-shielded units for dental use.

In speaking on nuclear research at the dedication, Dr. Cooldge pointed out the fact that scientists consider the physical world as largely empty space, with a comparatively few electrons, protons and neutrons scattered about; he added: "If all the particles comprising a human body could be brought into actual contact with one another, with the consequent elimination of the empty space between them, they would be visible only with a microscope."

In the production of high-voltage x-ray, he predicted that "the linear accelerator, which is undergoing development, may later become a successful competitor of the betatron and synchrotron."

Ceremonies were preceded by a tour of the factory, and followed by a tour of the laboratory and a dinner in the evening.

Correspondence

Editor The Focal Spot:

"That our membership be exempt from enrollment in labour unions." The writer feels that this resolution was pased without enough sound discussion and argument. Facts and figures should have been produced to compare the benefits of union negotiations or otherwise. Opinions of Saskatchewan technicians were solicited by me on this subject and without exception all asserted that union affiliation had put much more butter on their bread and more contentment within their homes—particularly those with families. The majority of us in Saskatchewan as Union members did not sign union cards with any intentions of casting a "sad reflection on the medical profession." That was the remotest thought possible in our minds. But we feel that with the better security and remuneration given us through our cards we are a much better asset to our medical men. The concensus of opinion was this: That Resolution No. 2 should not have been presented until the C.S.R.T. could take a stand in conjunction with our Radiologists to place a value on x-ray positions throughout Canada. That it would be the responsibility of the C.S.R.T. to see that technicians receive salaries in line with their positions, varying according to the times and to added responsibilities.

—D. M. MacKINNON, R.T.,
Weyburn, Sask.

Editor The Focal Spot:

As a member, yet more as an interested spectator of the C.S.R.T., I not only desire, but feel duty-bound, to express my thoughts on the training of x-ray technicians — especially since reading the report of the Examining Board in the July Focal Spot. At present is leaves much to be desired.

During the past month I have had the privilege of visiting several radiological departments. In a few — in a very few — I found the training of student technicians taken seriously. Interestingly, in these same hospitals, the percentage of registered technicians employed was high. In several departments the training offered was nothing but exploitation of cheap labor.

What then does the certificate of a registered technician mean.. It depends upon the standard set by the C.S.R.T. and maintained by its examining board, does it not? And according to the board's report, *the papers have been far too easy!*

Thus among our numbers are technicians who are undoubtedly experts, and whose superiority as radiographers is unrecognized and unrewarded by the Society. Such technicians are always recognized by their employers, who too often thank their lucky stars, and retain the technician at lower than deserved salaries. Among our numbers, also, are hundreds of mediocre technicians whose abilities probably merit some mark of average proficiency — and nothing more. Unfortunately among us also are a few morons.

What the "R.T." means then is that I am one of three things: (a) an insufficiently certified expert, (b) a plain, mediocre radiographer, or (c) an over qualified moron!

The need for a standardized course of studies is evident. The Committee on Technicians' Training outlines for the Society a suitable syllabus. Whose, then, are the responsibilities of presenting the course, and of checking student attendance? My own opinion is that these should be the responsibilities of the member societies, governed *strictly* by regulations of the C.S.R.T. Not until such a standard course — with a standard text covering all the items of the syllabus, and drawn up by a committee of the C.S.R.T. — not until such a course is offered all over Canada should the examinations be increased in severiety. And then they should be "stinkers."

Furthermore, suppose the C.S.R.T. were to organize examinations which could be written by registered technicians — not compulsory, mind — but merely post-graduate examinations which if passed would add to the prestige of the expert, or if failed would merely cost the ordinary technician his ten or twelve dollars. The tests might be based on technical articles presented in *The Focal Spot*, or in *Medical Radiography*, and they might also touch such side lines as the history of radiography, which remains fairly constant. Such examinations, if tough enough, could well serve to single out and distinguish the experts — the fellows who were not content with passing, but who just had to know more!

Well, these are just a few suggestions from my balcony seat. If they're worth anything, public opinion — or rather students' opinions will force them into reality. And if they ever do become realities, it is my bet that the profesional status of the registered technician will rise — as will his salary.

—JOHN R. SETTLE, B.Sc., R.T.,
Edmonton, Alta.

1948 REGISTRY

Canadian Society of Radiological Technicians

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MANITOBA SOCIETY OF X-RAY TECHNICIANS

The Manitoba Society held its first meeting after the holidays in the Board Room of the Winnipeg General Hospital.

There was a short business discussion, after which Mr. R. Gore, our official delegate to the annual convention at Quebec, gave a very full report of the sessions. A great deal of credit is coming to Roy for the time and work he has given for our Society.

Mr. C. J. Bodle gave a short address on the problems of the examining board of the C.S.R.T. Students! Beware of the examinations as they will be stiffer and the passing mark is to be raised from its present level.

We are planning a social function to renew interest among the members, after the holiday season.

Our October meeting was held at the Winnipeg General Hospital with about forty members in attendance. We were glad to have Mr. H. Burgess from Deloraine at our meeting. Out-of-town members are always welcome.

Miss M. Steski presided, as Mr. J. Zayshley, our President, was unable to attend.

After a short business session, the X-ray Staff of the Winnipeg General Hospital gave a very instructive demonstration of "Sterile Technique and X-ray Procedures in the Operating Room." This proved very interesting and was enjoyed by all the members.

Mr. Wm. Doern then showed an educational and entertaining film entitled "Family Album," which showed the proper use of lighting for indoor photography. This film was obtained through the courtesy of the General Electric Corporation.

Many thanks are due Mr. Doern and his staff for a very instructive and entertaining evening. Members discussed having programmes of this type more often.

We were also able to see a sample of our C.S.R.T. Lapel Pins. They are very smart-looking pins and any member wanting one should get in touch with Mr. Roy Gore, c/o Winnipeg Clinic.

Congratulations are extended to the following new members on receiving their certificates:

MRS. OLGA BACKHOUSE
MISS CHRISTINE BAILEY
MISS JEAN FORBES
MR. DOUGLAS PURTON
MR. RALPH TACZINSKI
MR. GRAHAM WARDLEY
MR. EDWARD WHEELER

—M. CARLSON, R.T.,
Sub-Editor.

NEW BRUNSWICK SOCIETY OF X-RAY TECHNICIANS

Our regular meeting was held at City Hospital in the Hub City of the Maritimes, Moncton, New Brunswick, famed for its magnetic hill and tidal bore.

We were privileged in having as our guest, Mr. Albert Perry, our well-known neighbour from the Nova Scotia Society of Radiographers. Mr. Perry very briefly told us of some of the plans already in progress for the C.S.R.T. Convention in Halifax next year. To which we heartily add: "Halifax! Here we come!" We hope Mr. Perry will be able to come back to visit us soon.

At the business session Miss K. Creelman presided.

The program which followed the Business Meeting proved not only interesting but highly instructive, with Dr. H. R. Ripley presenting a lecture on Chest Pathology, reviewing the anatomy and illustrating points of importance by means of diagrams and lantern slides. "Thank you," Dr. Ripley, for an address enjoyed by all.

Then business finished and the instructive portion of our evening concluded, we enjoyed delightful refreshments provided by Miss Creelman and Mr. McLaughlin.

We would like to congratulate the following technicians on receiving that much-coveted C.S.R.T. diploma:

Rev. Sr. M. Edith Keefe, Charlottetown, P.E.I.
Miss Mary Silliphant, Charlottetown, P.E.I.
Miss Ruby Morrison, Summerside, P.E.I.
Mr. J. A. Hache, Bathurst, N.B.

We were pleased to hear that Miss E. Feetham has come away down east to Campbellton, New Brunswick. Miss Feetham hails from Manitoba, and is now on the X-Ray Staff of the Soldiers' Memorial Hospital, in Campbellton. We hope Miss Feetham likes the Maritimes and decides to transfer her membership to our society.

The Society members are happy to welcome back Dr. and Mrs. W. A. Farrell. Dr. Farrell, Radiologist at Lancaster Hospital, has been on leave of absence for the past year while engaged in special studies at the University of Toronto.

Also we are very pleased to have Rev. Sr. de Lellis' name back on our membership roll. Sr. de Lellis has been away for the past few years while furthering her studies at University of Saint Louis, Saint Louis, Missouri. We are now delighted to congratulate her on receiving her B.Sc. degree in Radiologic Technology.

The only disappointing feature of our last regular meeting in Moncton, N.B., was that more technicians were not present to enjoy the friendly hospitality one finds at these meetings. We feel that you are really missing something and we certainly hope that more of you will endeavour to be with us at Lancaster Hospital, Saint John, where we hope to hold our next meeting.

—LOIS McNAIR, R.T.,
Sub-Editor.

ONTARIO SOCIETY OF RADIOGRAPHERS

Thirteenth Annual Convention

The Thirteenth Annual Meeting and Convention of the Ontario Society of Radiographers was held at the Royal York Hotel, Toronto, from Thursday afternoon, September 23rd, to Saturday, September 25th.

The chairman for the afternoon was Mr. George Reason, of Toronto, and the first speaker was Mr. R. McCaw, of Sunnybrook Hospital. His paper, entitled "Immobilization in Radiography" stressed the purpose, advantages, and considerations for attainment of immobilization. and was well illustrated by the use of lantern slides of charts and effective photographs of correct and incorrect methods of immobilization.

Following this, the 13th Annual Meeting of the Ontario Society of Radiographers was held, with Mr. Hugh Menagh, President, presiding over the meeting. The minutes of the last meeting, read by Mrs. Elizabeth Mills, Secretary-Treasurer, were approved. Mr. Menagh then gave the President's address. Next the Secretary's report and the Treasurer's report were read by Mrs. Mills and approved. It was proposed that the report of the delegate to the Canadian Society of Radiological Technicians be published in The Focal Spot. Miss Madge Morris and Mr. Leslie Fox were appointed as scrutineers to count the ballots. While this was being done Mr. Menagh clearly outlined the progress of the technical education programme for Ontario, under the direction of Dr. D. T. Burke, making special reference to the Anatomy course at the University of Toronto and the Physics course at the Central Technical School. The President said that he "knew this course on anatomy will be constantly improved untii it is perfect." Already certain advances had been made in the course on Physics and an x-ray machine had been obtained for use at the school. The course this year will include technical instruction as well as circuit lay-outs and trouble localization. Mr. Menagh stressed the need for higher education among technicians and strongly recommended these two courses. Other business was discussed and then the President expressed his appreciation of the support he had received from the Executive during the past year. The results of the voting were announced, the new Executive being as follows: President, Mr. Alex. Nelson, London; President-elect, Mr. John Collins, St. Catharines; Secretary-Treasurer, Miss Jane Martin, Hamilton; Executive, Miss Ernestine Chiasson, Toronto and Mr. David Sage, Hamilton. The date of next year's Convention was discussed, and June was decided upon. Mr. Reason moved that an Honorarium of $25.00 be presented to Mrs. Mills for her untiring work throughout the year. The Annual Meeting then adjourned.

The next paper on the programme was "Vertical Tomography" by Mr. Stewart Olheiser, of Queen Alexandria Sanatorium, London. As

there is practically no vertical tomography done in Canada this paper evoked decided interest in all who heard it, and the excellent delivery of Mr. Olheiser made it quite evident that he knows his subject very well. He stressed the reason for vertical rather than horizontal tomography, and outlined on a blackboard the apparatus they have constructed at the Queen Alexandra Sanatorium. He then showed films demonstrating the value of the procedure. The enthuiastic response to his paper was shown in the many questions asked by members of the audience. At the end of the discussion Dr. D. T. Burke of Sunnybrook and Christie St. Hospitals extemporaneously expressed his admiration of Mr. Olheiser's paper and work and stated that much more vertical tomography will be done in the near future.

Thursday evening entertainment was provided in the form of two interesting and instructive movies on Television and Frequency Modulation, made by the General Electric Corporation. These were followed by two colorful movies by the National Film Board, entitled "You Take the High Road," showing many of the natural beauty spots of Canada, and "Trout Fishing Across Canada," which delighted the eye of many an avid angler in the audience.

The Friday morning session was presided over by Mr. Hugh Menagh, and the Convention was officially opened by Controller Roelfson, who spoke of his personal contact with members of our profession in the past and his ensuing appreciation of the value of our work.

The first paper, entitled "The Tempero-Mandibular Joint," was presented by Mr. George Ross, of Sunnybrook Hospital. Illustrated by excellent slides of anatomical drawings and photographs of positioning, this paper brought out many of the positions and views which can be used to demonstrate the tempero-mandibular joint.

The next speaker on the programme was Mr. Frank Dreisinger of the University of Rochester, who spoke on "Cineradiography." This is another little-explored field of radiography, and Mr. Dreisinger has done a great deal of research in establishing the procedures used at the University of Rochester. His detailed description of the equipment used, and the methods of operation, gave everyone present a clear idea of how cineradiography is accomplished, and of its exceptional value.

Following this, Dr. Joseph Sommers, 310 Bloor St. West, Toronto, spoke on "X-Ray Therapy." Dr. Sommer's paper was concise but conclusive on the subject of the many uses of x-ray therapy, its biological effect, the voltages required for different types of therapy, the methods of varying the therapy dose other than by voltage, and the means of protection to patient and technician, as well as other important facts relating to this essential work.

The final paper of the morning was by Mr. John Laxton, of Sunnybrook Hospital. Entitled "Darkroom Chemistry," it dealt with detailed basic chemistry and construction of film, including the percentage composition of an emulsion. Mr. Laxton illustrated his paper by means of unique lantern slides, which symbolized the effect of each step of darkroom processing on exposed and unexposed grains in the film emulsion.

Following this luncheon was served in the beautiful Roof Garden Dining Room, where the Guest Speaker was Dr. Harold Couch, of the surgical staff of the Toronto General Hospital. Dr. Couch's sparkling humour interspersed an address which pointed out the good understanding between the technical and professional members of the medical profession as an example to the nations of the world.

The opening paper of the afternoon was "Radiography of the Paranasal Sinuses" by Miss Jane Martin of Hamilton, Mr. Paul Frederick, presiding.

Next an extremely interesting paper entitled "A Case of Emphysema in the Subcutaneous Tissues of Traumatic Origin" was read by Sister Eucheria of Toronto. This paper was prepared by Rev. Sister Marie de la Merci under the supervision of Dr. Jules Gosselin, at Saint Sacrement Hospital, Quebec City. It described a very rare condition and was illustrated by lantern slides of photographs and radiographs of the patient at various stages in his condition.

Then an instructive Brain Trust was held, with Dr. Worth, Radiologist of Wellesley Hospital, Toronto, and Mr. Sweeney, Physicist of the Ferranti Electric Ltd., capably expounding on all questions put to them for the benefit of all present.

There followed an interval during which the many excellent exhibits drew the attention of all. There were examples of almost every type of radiographic examination, from gall bladders, skulls, and spines, to cerebral arteriography and insufflation of Fallopian tubes. The judges of

the Film Exhibits—Dr. W. C. Kruger of Toronto Western Hospital, Dr. K. L. McEwan, Toronto General Hospital, and Mr. L. J. Cartwright—had some difficult decisions to make, but eventually allotted the prizes to the anonymous numbers which materialized into jubilant prize-winners at the banquet the following evening. A very unique exhibit, which was not entered in competition, was presented by Sunnybrook Hospital. This was a special viewing desk made under the guidance of Dr. Burke, by Mr. Wm. Parsons, the originator of the idea. The construction of this desk permits eight racks of four 14 x 17 panels to be mounted with films and viewed against the four panel view box. They plan to control the movement of the panels electrically, and the desk will be of tremendous value in studying and teaching.

At 6.00 p.m. a delicious Buffet Supper was served, our generous hosts being the Associate Members.

After this came a delightful treat in the form of two exceedingly fine movies, mostly in color, made by Dr. A. C. Singleton, of Toronto, who gave an entertaining running commentary. The first, which he took during the war, showed many of the most beautiful spots in the south of England, and everyone marvelled particularly at the gorgeous flowers and flowering shrubs. The second, taken earlier, showed highlights of a pleasure cruise of the Carribean and through the Panama Canal, and was a marked contrast to the first. Both movies ended with Dr. Singleton's inimitable trademark — a magnificent sunset.

The programme ended with a film by the National Film Board dealing with displaced persons in Europe.

The Saturday morning session was presided over by Mr. John Collins of St. Catharines, and the first paper was by Dr. C. G. Shaver, of the Niagara Peninsula Sanatorium, on the Radiographic Aspects of Shaver's Disease. This disease is caused by inhaling aluminum oxide and it was Dr. Shaver who first proved this. He showed many films of the chest demonstrating this rare condition.

The next paper, entitled "Canadian Army Foot Technique," was presented by Dr. R. I. Harris, Surgeon-in-Chief of the Toronto General Hospital, who was Chief Consultant in Orthopedic Surgery to the Canadian Army during the war. Dr. Harris explained that the Canadian Army Foot Technique was developed as part of an enlistment survey made of 3,600 recruits, to establish the cause of loss of soldiers to service due to foot trouble. He described the rigid standardized technique used and showed lantern slides illustrating it. Through this technique structural defects were shown to which they were able to trace foot trouble which occurred during army training.

The final speaker of the morning was Miss Margaret Bartram, of Sunybrook Hospital, whose interesting paper, "Breathing in Radiography," was published in the last issue of The Focal Spot.

Then came the highlight for which we had all been waiting. Upon climbing into buses, we drove through the sunny streets eastward, then northward, to Sunnybrook Hospital. For the majority it was a first visit, and the magnificence of the beautiful buildings and the peaceful surroundings was most impressive. In the foyer of the main building we were introduced by Dr. Burke to Col. LeMesurier, Hospital Manager, who welcomed us. Mr. Menagh replied to Col LeMesurier's address of welcome. Then we were conducted to the staff dining room, where the delicious food and delightful atmosphere were fully enjoyed. Thus fortified, we proceeded to one of the lecture halls, where we were addressed by Major A. S. Spencer, the Resident Architect of the Hospital, who gave us a general outline of the plans and size of the hospital, the functions of the various sections, and interesting details of construction, color scheme and quantities of materials used to build the entire project. At the conclusion of his address, we were divided into two groups, led by Major Spencer and taken on a tour through the main Assembly Hall, the Recreation Room, the Library, a typical ward, an operation room and recovery rooms, an outdoor sunning deck, one of the patients' dining rooms, the spotless kitchens, and back to the main foyer. There we were divided into smaller groups under the guidance of members of the x-ray staff, who conducted us on a tour of the x-ray department. The lay-out of this department is clearly designed to handle a maximum of work with a maximum of efficiency. It will be a truly model department, well equipped for teaching radiography with its large museum room, which will contain several of the special viewing desks mentioned above. The president moved a very

hearty vote of thanks to Col. Hollis and the entire Sunnybrook staff.

Through his careful planning we were able to tour the buildings and enjoy the hospitality of his gracious staff.

The Society also owes a great deal to Dr. Burke who made our visit to the x-ray department memorable by his smooth organization of the tours. Dr. Burke's unfailing support and interest in the Society are greatly appreciated, and his helpful advice and assistance were invaluable in making the Convention programme a success.

Early on Saturday afternoon a complete demonstration of Encephalography was put on in the X-Ray Department of the Toronto General Hospital. Dr. Woolin, Radiologist, gave a running commentary on the procedure while Dr. Fitzgerald of the Department of Neuro-Surgery looked after the surgical procedures and Mr. Walter Whitehouse took the radiographs. Space limitations made it necessary to limit the number of observers and many who would have liked to be present at this valuable demonstration were heard to express their regrets that this necessity and the counter-attraction of the visit to Sunnybrook Hospital prevented them from seeing it. However, the dozen technicians who were able to be present felt that they were amply rewarded and expressed their thanks to Drs. Woolin and Fitzgerald and Mr. Whitehouse for giving them this opportunity.

The Convention ended with a Banquet at which the genial Guest Speaker was Mr. A. Anderson, of Ferranti Electric Ltd. Mr. Anderson announced the winners of the film exhibit and Mr. Menagh presented the prizes which were as follows:

1st prize: Miss Shirley Babin, Medical Arts Bldg., Toronto—OSR Ring and a Hudson's Bay blanket.

2nd prize: Mrs. Mary Cameron, Hamilton—a Hudson's Bay blanket.

3rd prize: Mr. Paul Frederick, W.C.B., Toronto—a fountain pen and pencil set.

4th prize: Mr. Ken Hall, Ottawa—an O.S.R. pin.

5th prize: Miss Gladys Musgrove—an O.S.R. pin.

6th prize: Miss Frances Garnet—an O.S.R. pin.

The crowning point of the evening was Mr. Anderson's address, in which he outlined in his own inimitable fashion, the development of x-ray work and x-ray equipment throughout his long association with it.

Following this, the room was cleared, and Mr. Bob McCaw led a vigorous routine of grand marches, square dances, and Paul Jones's, which were heartily enjoyed, as well as the ballroom dancing. And so ended the 13th Annual Convention, with a total registration of one hundred and twenty in all.

The Society is indebted to the following firms and individuals who donated prizes, and helped the Convention Committee with their generous support:

Ansco of Canada Ltd., Toronto.
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X-Ray and Radium Industries Ltd., Toronto.
X-Ray Service & Supplies, Toronto.

Dr. A. C. Singleton has been appointed Associate Professor of Radiology at the University of Toronto.

At the last Executive meeting Sectional Chairmen were appointed as follows: Central Section: Mr. Walter Whitehouse, Toronto; Western Section: Mrs. Gladys Cassidy, Leamington. The Eastern Chairman has not been chosen yet.

Sister Mary Vincentia, R.N., M.O.S.R., of St. Vincent de Paul Hospital, Brockville, Ont., has been appointed Mother Superior of that hospital.

Back on the 22nd of August Mr. and Mrs. George Reason celebrated their 25th wedding anniversary. This is a real achievement these days and we tender them our felicitations and our best wishes for the next twenty-five years.

Paul Frederick had a real Thanksgiving Day when his wife presented him with a daughter.

Shirley Baden, Medical Arts Bldg., Toronto, winner of the first prize in the film exhibit at the recent Ontario convention, has moved to Vancouver. Best wishes of her numerous friends here go with her.

We hear that Bill Osborne, another former Torontonian, who left for Vancouver a few years back, is now Chief Technician at a Clinic there.

Alec Boken, well-known Ferranti service man, was recently launched on the sea of matrimony and we wish Mr. and Mrs. Boken every happiness in the coming years.

—JANE MARTIN, R.T.,
Sub-Editor.

A Review of the Educational Problem

By ANNE HAYWARD

It is incredible that after sponsoring the training of technicians for fourteen years, the Ontario Society of Radiographers must still say, "We have no schools in the proper sense, nor have we teachers."

This state of affairs has never ceased to burden the minds of those who have realized the value of their work as an aid in the treatment of sick people.

Technicians generally can be commended for organizing, working out some sort of curriculum, preparing papers, and for passing on to the other fellow what knowledge they could gain by reading, observation and practice. But this is not good enough. Self education, however desirable, is only one phase of any sound teaching programme. There must be schools and properly qualified teachers.

During the winter of 1947 reports drifted into the Executive of the unique efforts of Dr. Burke towards training technicians in his own department. He was invited to attend one of our Executive Meetings. For the first time, we received not only encouragement but real practical help. We were going to be able to share in the Christie St. programme. When the evening classes in Radiographic Anatomy at the Toronto University were planned, the hospitals and labs in the surrounding district were circularized; and those who could be accommodated were taken into the course. When the evening classes in Physics at the Central Technical School were organized, the same thing occurred. Those who were privileged to attend the lectures in Anatomy given by Dr. Burke, were unanimous in their praise and appreciation.

In the Spring of 1948, Dr. Burke was appointed Technical Advisor to the Ontario Society of Radiographers.

The Fall of 1948 sees a continuance of the courses in Anatomy and Physics—Saturday morning lectures at Sunnybrook Hospital, to which anyone is invited. It sees also full support given by the Executive on November 5th, 1948, to the idea of a new and better approach to the problem of education. Ways and means are being devised to enable the whole technical body to participate in and help bring about a new era in knowledge, usefulness and prestige for Technicians in Ontario. More anon!

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Albert Strafford Retires From the Technical Staff of the Royal Victoria Hospital

On the afternoon of August 31st, 1948, the staff of the X-Ray Department, Royal Victoria Hospital, gathered at a reception in honour of Albert Strafford upon the occasion of his retirement from the technical staff.

Dr. E. C. Brooks, in a witty speech, reminisced about old times, and briefly outlined some of the highlights of Mr. Strafford's career during his years at the hospital. Mr. Strafford was then presented with a travelling bag, with the suggestion that it might be useful during the pleasure jaunts that would no doubt feature his extended holiday.

Mr. Strafford's x-ray career covers a period of thirty-three years. During the Great War of 1914-1918, he served with the C.A.M.C. as x-ray technician, at the Canadian Military Hospitals at Moore Baracks and Hastings in England. On his discharge from the army, he returned to Edmonton, Alberta, as technician, associated with Dr. George Malcolmson, and in November, 1919, he transferred to the staff of the Royal Victoria Hospital, Montreal, as chief technician under Dr. A. Howard Pirie, who was Radiologist-in-Chief at that time.

During his long years at the Royal Victoria Hospital, Mr. Strafford has been instrumental in training about 40 technicians, among whom were many of the Navy Personnel of the Second World War.

His chief aim as instructor was to turn out pupils equipped with a sound practical and theoretical knowledge of their subject and possessed with a feeling of confidence and independence in the performance of their duties.

Resourcefulness was one of his outstanding characteristics, and this quality he always tried to pass on to his pupils.

At the end of this busy career, all the staff wish Mr. Strafford long life, good health, and the enjoyment of his leisure, including much success in his favourite sport of fishing, and many happy hours in his home and garden at Cartierville.

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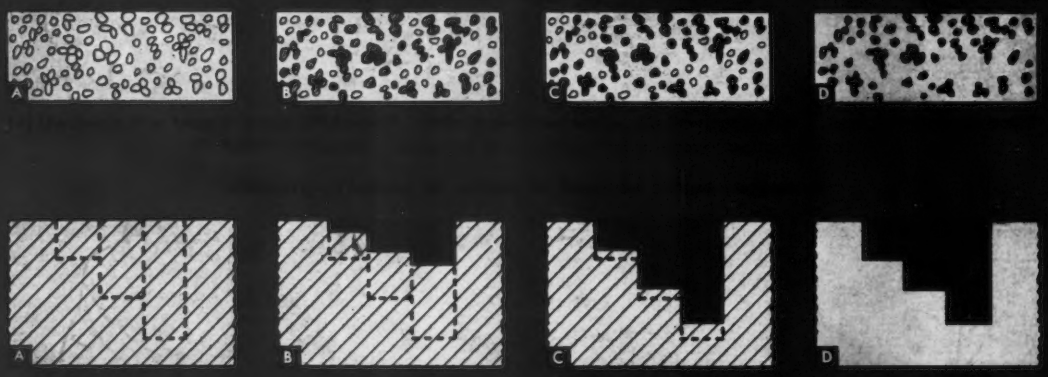

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